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SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Duy-Vu Deo Examiner #: 75770 Date: 12/5/02
Art Unit: 1765 Phone Number 305-0515 Serial Number: 09/744,212
Mail Box and Bldg/Room Location: 10B22 CP-3 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _____

Inventors (please provide full names): _____

_____

Earliest Priority Filing Date: July 1998

***For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.**

- Please search for claims 34-38
- vapor etching that use DC supply. (please see pages 24-26 for more info.)

****

STAFF USE ONLY	Type of Search		Vendors and cost where applicable	
Searcher: EA	NA Sequence (#)		STN	$123.31
Searcher Phone #:	AA Sequence (#)		Dialog	
Searcher Location:	Structure (#)		Questel/Orbit	
Date Searcher Picked Up:	Bibliographic		Dr.Link	
Date Completed: 12-12-02	Litigation		Lexis/Nexis	
Searcher Prep & Review Time: 15	Fulltext		Sequence Systems	
Clerical Prep Time:	Patent Family		WWW/Internet	
Online Time: TO	Other		Other (specify)	

PTO-1590 (8-01)

the support to accelerate ions onto the substrate for at least part of the cycle.

31. An apparatus according to ~~any one of Claims 27 to 30,~~ Claim 27 further comprising means for providing radiation energy into the chamber, and/or means for controlling the substrate temperature, and/or means for rotation for enhancing the homogeneity of the etching.

32. An apparatus according to ~~any one of Claims 27 to 31,~~ claim 27 wherein the means for etching the substrate, means for depositing the passivation layer and means for selectively removing the passivation layer are associated with a single chamber.

33. An apparatus for performing the method of ~~any one of Claims 1 to 26,~~ Claim 1 the apparatus comprising means for etching a substrate material or a film present on the material surface with one or more appropriate chemicals, means for depositing a passivation layer on the surfaces of an etched feature, and means for selectively removing the passivation layer from the etched feature in order that the etching proceeds in a direction substantially perpendicular to the material or film surface wherein each of the means for etching, means for depositing the passivation layer and means for selectively removing the passivation layer are associated with the same or a separate chamber in which the substrate is positioned.

34. A method of delivering a vapour into a chamber for etching a substrate positioned therein, the method comprising:

(a) feeding a solution into the chamber by creating droplets on or before entering the chamber; and

(b) generating an electrostatic field to electrostatically attract the droplets to the substrate, thereby etching the substrate.

35. A method according to claim 34, wherein the droplets are provided with a positive or negative charge on or before entering the chamber, preferably created by means of a high voltage power supply connected to a droplet inlet point into the chamber, the substrate then optionally being positioned on an electrode which is grounded with respect to the high voltage power supply.

36. A method according to claim 34 ~~or Claim 35~~, wherein the strength of the electrostatic field is in the range of 2 to 30kV/mm.

37. A vapour delivering apparatus comprising a dielectric body within which are positioned a plurality of nozzles, each nozzle extending from the back side of the body to the front side, wherein the body is metallized to form a continuous electrical path between the back side and the inside of each nozzle to the tip thereof.

38. A vapour delivering apparatus according to claim 37, further comprising electrical connections from a power supply to the metallized part of the body, and wherein optionally different areas of the body are connected to a power supply to create a varying electric field across the body.

39. A method of treating a substrate according to Claim 1 and substantially as hereinbefore described with reference to the accompanying drawings.

40. An apparatus substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.

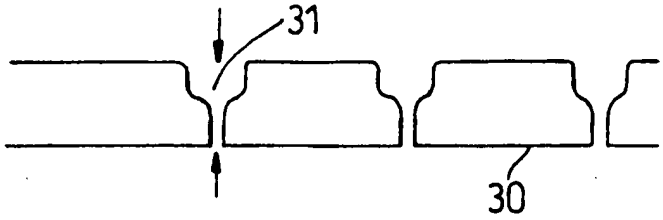

Fig. 10A

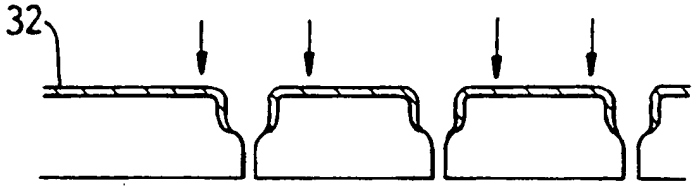

Fig. 10B

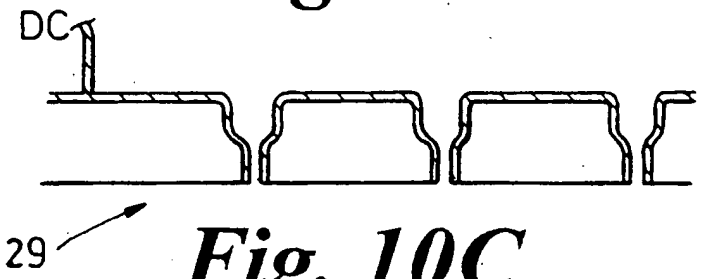

Fig. 10C

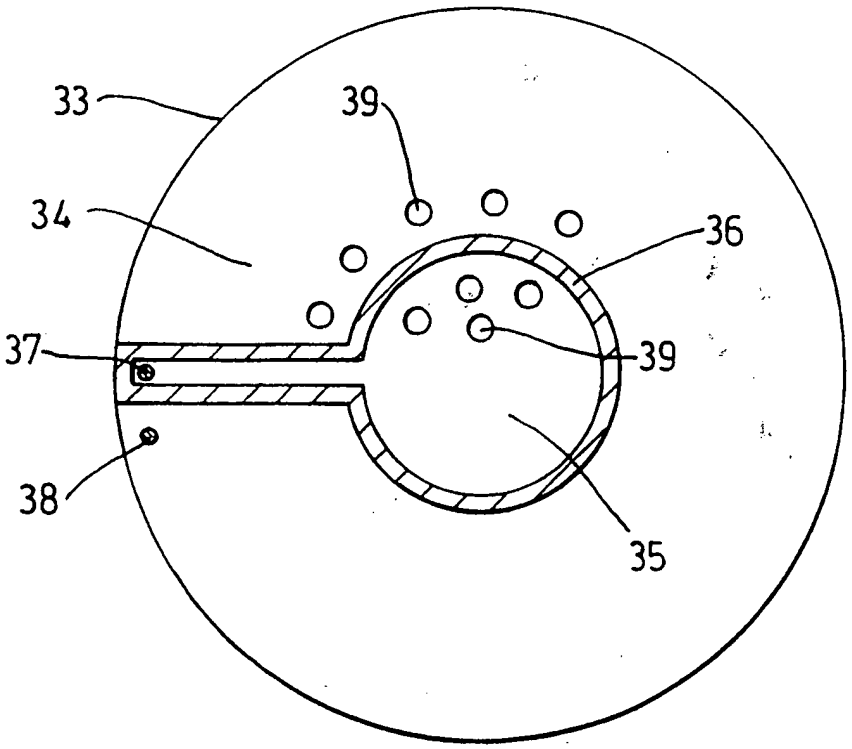

Fig. 11

Electrostatic spray delivery techniques may be used as follows:

a) the solution is fed into the chamber (for example by means of an MFC or syringe or constant static pressure feed pump) creating a stream of droplets; and

b) an electrostatic field is generated to electrostatically attract the droplets to the substrate.

Droplets are provided with a positive or negative DC charge by means of a high voltage power supply connected to the droplet inlet point into the chamber. The substrate electrode is grounded with respect to the DC supply. At the droplet inlet, typical electrostatic field strengths in the range 2 to 30kV/mm are required. At these intensities, a corona discharge is created at the inlet point which helps to charge and atomize the droplets and direct the resultant spray towards the grounded substrate electrode. Charging of the droplets can also increase the process reaction rate. Solution conductivity can also influence the droplet size. For example, ethanoic acid addition results in increased electrical conductivity and thereby results in a finer droplet spray.

Ideally the outlet consists of a nozzle with less than or equal to 1mm inner diameter. Practically, in order to get good uniformity across relatively large areas, one of the following methods may be needed:

a) raster scanning of one of more nozzles (which only allow partial spray coverage over the substrate) and/or appropriate substrate rotation;

b) multiple nozzles to allow full substrate coverage with

possible substrate rotation (see below).

Multiple nozzle showerhead to allow full substrate coverage

Current methods and prior art refer to the use of one or more nozzles to introduce the vapor. The nozzles must be conducting to allow electrostatic charging of the tip. As the tip dimension is small (<1mm), electric field enhancement occurs. This enhancement increases the electric field at the tip from in the range of 2 to 30 kV/mm by several orders of magnitude. At these high fields, a local corona discharge will occur, which assists in the creation of a fine charged droplet spray which is attracted towards the DC grounded substrate electrode. Practically it is difficult to use large numbers of nozzles to cover large area substrate processing.

This aspect of the invention relates to the design of a showerhead which allows both uniform vapor distribution as well as maintaining high electric field enhancement factors.

Figure 10 shows the fabrication steps for the manufacture of the showerhead 29, namely:-

A. A dielectric plate 30 (such as quartz, glass or pyrex) is drilled from the back side with tapering holes 31 (or a number of superimposed holes with reducing diameter) to create the required nozzle shape. Small size holes (for example up to 1mm) are drilled from the front, followed by larger holes drilled from the back side. The number of holes and separation chosen depends on the required electric field enhancement vapor flow rate and pressure.

B. The back side 32 of the plate is then metallized to form

a continuous electrical path between the back surface and the inside of each of the nozzles up to the tip of each nozzle.

C. Electrical connections are then made to the metallized section on the back side for the dc power supply.

Figure 11 shows a variation where different areas of the showerhead 33 can be connected to different power supplies with either the same potential, or different potentials to create a field gradient across the nozzle tip showerhead. This may be used to tailor the vapor distribution across the showerhead. The showerhead is divided into zones 34,35 by a non-metallised section 36, with separate DC contacts 37,38 being made to each zone. The nozzle holes 39 (partially shown only) will uniformly cover the showerhead 33.

```
=> file home
FILE 'HOME' ENTERED AT 15:07:33 ON 12 DEC 2002

=> d his


     FILE 'HCA, WPIX, JAPIO' ENTERED AT 14:04:20 ON 12 DEC 2002
L1        164706 SEA ETCH? OR MICROETCH?
L2        111345 SEA ETCH? OR MICROETCH?
L3         99010 SEA ETCH? OR MICROETCH?
     TOTAL FOR ALL FILES
L4        375061 SEA ETCH? OR MICROETCH?
L5        201714 SEA ETCH? OR MICROETCH? OR CHASE# OR CHASING# OR ENCHAS?
                 OR ENGRAV? OR MICROENGRAV? OR EMBOSS? OR INCISE# OR
                 INCISING# OR IMPRINT? OR IMPRESS?
L6        162209 SEA ETCH? OR MICROETCH? OR CHASE# OR CHASING# OR ENCHAS?
                 OR ENGRAV? OR MICROENGRAV? OR EMBOSS? OR INCISE# OR
                 INCISING# OR IMPRINT? OR IMPRESS?
L7        167686 SEA ETCH? OR MICROETCH? OR CHASE# OR CHASING# OR ENCHAS?
                 OR ENGRAV? OR MICROENGRAV? OR EMBOSS? OR INCISE# OR
                 INCISING# OR IMPRINT? OR IMPRESS?
     TOTAL FOR ALL FILES
L8        531609 SEA ETCH? OR MICROETCH? OR CHASE# OR CHASING# OR ENCHAS?
                 OR ENGRAV? OR MICROENGRAV? OR EMBOSS? OR INCISE# OR
                 INCISING# OR IMPRINT? OR IMPRESS?
L9        489627 SEA VAPOR? OR VAPOUR?
L10       171393 SEA VAPOR? OR VAPOUR?
L11        87624 SEA VAPOR? OR VAPOUR?
     TOTAL FOR ALL FILES
L12       748644 SEA VAPOR? OR VAPOUR?
L13      2153569 SEA VAPOR? OR VAPOUR? OR GAS## OR GASEOUS? OR GASIF? OR
                 FUME# OR FUMING# OR MIST OR MISTS OR MISTED OR MISTING#
                 OR AEROSOL? OR AERIF? OR AERAT? OR SPRAY? OR ASPERS? OR
                 ASPERAG? OR ATOMIZ? OR ATOMIS? OR VOLATILIZ? OR VOLATILIS
                 ?
L14      1093965 SEA VAPOR? OR VAPOUR? OR GAS## OR GASEOUS? OR GASIF? OR
                 FUME# OR FUMING# OR MIST OR MISTS OR MISTED OR MISTING#
                 OR AEROSOL? OR AERIF? OR AERAT? OR SPRAY? OR ASPERS? OR
                 ASPERAG? OR ATOMIZ? OR ATOMIS? OR VOLATILIZ? OR VOLATILIS
                 ?
L15       536804 SEA VAPOR? OR VAPOUR? OR GAS## OR GASEOUS? OR GASIF? OR
                 FUME# OR FUMING# OR MIST OR MISTS OR MISTED OR MISTING#
                 OR AEROSOL? OR AERIF? OR AERAT? OR SPRAY? OR ASPERS? OR
                 ASPERAG? OR ATOMIZ? OR ATOMIS? OR VOLATILIZ? OR VOLATILIS
                 ?
     TOTAL FOR ALL FILES
L16      3784338 SEA VAPOR? OR VAPOUR? OR GAS## OR GASEOUS? OR GASIF? OR
                 FUME# OR FUMING# OR MIST OR MISTS OR MISTED OR MISTING#
                 OR AEROSOL? OR AERIF? OR AERAT? OR SPRAY? OR ASPERS? OR
                 ASPERAG? OR ATOMIZ? OR ATOMIS? OR VOLATILIZ? OR VOLATILIS
                 ?
L17        96513 SEA ELECTROSTATIC? OR ELECTRO(2A)STATIC?
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L18       66474 SEA ELECTROSTATIC? OR ELECTRO(2A)STATIC?
L19       61098 SEA ELECTROSTATIC? OR ELECTRO(2A)STATIC?
     TOTAL FOR ALL FILES
L20      224085 SEA ELECTROSTATIC? OR ELECTRO(2A) STATIC?
L21         378 SEA SHOWERHEAD? OR SHOWER?(2A)HEAD?
L22        2571 SEA SHOWERHEAD? OR SHOWER?(2A)HEAD?
L23        1037 SEA SHOWERHEAD? OR SHOWER?(2A)HEAD?
     TOTAL FOR ALL FILES
L24        3986 SEA SHOWERHEAD? OR SHOWER?(2A) HEAD?
L25           0 SEA (METALLIZ? OR METALLIS? OR METALIS? OR METALIZ? OR
                 GALVANI? OR ANODIZ? OR ANODIS? OR PLATED OR PLATING# OR
                 ELECTROPLAT? OR ELECTRODEPOSIT? OR ELECTROCOAT? OR
                 ELECTROMETAL? OR CLAD OR CLADS OR CLADDED OR CLADDING#)(3
                 A)(SHOWERHEAD? OR SHOWER?(2A)HEAD?)
L26           0 SEA (METALLIZ? OR METALLIS? OR METALIS? OR METALIZ? OR
                 GALVANI? OR ANODIZ? OR ANODIS? OR PLATED OR PLATING# OR
                 ELECTROPLAT? OR ELECTRODEPOSIT? OR ELECTROCOAT? OR
                 ELECTROMETAL? OR CLAD OR CLADS OR CLADDED OR CLADDING#)(3
                 A)(SHOWERHEAD? OR SHOWER?(2A)HEAD?)
L27           0 SEA (METALLIZ? OR METALLIS? OR METALIS? OR METALIZ? OR
                 GALVANI? OR ANODIZ? OR ANODIS? OR PLATED OR PLATING# OR
                 ELECTROPLAT? OR ELECTRODEPOSIT? OR ELECTROCOAT? OR
                 ELECTROMETAL? OR CLAD OR CLADS OR CLADDED OR CLADDING#)(3
                 A)(SHOWERHEAD? OR SHOWER?(2A)HEAD?)
     TOTAL FOR ALL FILES
L28           0 SEA (METALLIZ? OR METALLIS? OR METALIS? OR METALIZ? OR
                 GALVANI? OR ANODIZ? OR ANODIS? OR PLATED OR PLATING# OR
                 ELECTROPLAT? OR ELECTRODEPOSIT? OR ELECTROCOAT? OR
                 ELECTROMETAL? OR CLAD OR CLADS OR CLADDED OR CLADDING#)(3
                 A)(SHOWERHEAD? OR SHOWER?(2A) HEAD?)
L29      125371 SEA DC OR D(W)C OR DIRECT?(2A)CURRENT?
L30      152884 SEA DC OR D(W)C OR DIRECT?(2A)CURRENT?
L31      106936 SEA DC OR D(W)C OR DIRECT?(2A)CURRENT?
     TOTAL FOR ALL FILES
L32      385191 SEA DC OR D(W) C OR DIRECT?(2A) CURRENT?
L33       42851 SEA NOZZLES OR JETS
L34       81338 SEA NOZZLES OR JETS
L35       27660 SEA NOZZLES OR JETS
     TOTAL FOR ALL FILES
L36      151849 SEA NOZZLES OR JETS
L37      497431 SEA INLET? OR OUTLET? OR PORT OR PORTS OR PORTAL? OR
                 NOZZL? OR JET OR JETS OR OPENING# OR APERTUR? OR HOLE OR
                 HOLES
L38     1861780 SEA INLET? OR OUTLET? OR PORT OR PORTS OR PORTAL? OR
                 NOZZL? OR JET OR JETS OR OPENING# OR APERTUR? OR HOLE OR
                 HOLES
L39     1149477 SEA INLET? OR OUTLET? OR PORT OR PORTS OR PORTAL? OR
                 NOZZL? OR JET OR JETS OR OPENING# OR APERTUR? OR HOLE OR
                 HOLES
     TOTAL FOR ALL FILES
L40     3508688 SEA INLET? OR OUTLET? OR PORT OR PORTS OR PORTAL? OR
                 NOZZL? OR JET OR JETS OR OPENING# OR APERTUR? OR HOLE OR
```

HOLES
L41 738 SEA (L1 OR L5) AND (L9 OR L13) AND L29
L42 518 SEA (L2 OR L6) AND (L10 OR L14) AND L30
L43 1355 SEA (L3 OR L7) AND (L11 OR L15) AND L31
TOTAL FOR ALL FILES
L44 2611 SEA (L4 OR L8) AND (L12 OR L16) AND L32
L45 15 SEA L41 AND L17
L46 31 SEA L42 AND L18
L47 86 SEA L43 AND L19
TOTAL FOR ALL FILES
L48 132 SEA L44 AND L20
L49 0 SEA L41 AND L21
L50 1 SEA L42 AND L22
L51 0 SEA L43 AND L23
TOTAL FOR ALL FILES
L52 1 SEA L44 AND L24
L53 2 SEA L45 AND (L33 OR L37)
L54 9 SEA L46 AND (L34 OR L38)
L55 22 SEA L47 AND (L35 OR L39)
TOTAL FOR ALL FILES
L56 33 SEA L48 AND (L36 OR L40)
L57 11 SEA L45 AND L1
L58 23 SEA L46 AND L2
L59 44 SEA L47 AND L3
TOTAL FOR ALL FILES
L60 78 SEA L48 AND L4
L61 10 SEA L45 AND L9
L62 9 SEA L46 AND L10
L63 8 SEA L47 AND L11
TOTAL FOR ALL FILES
L64 27 SEA L48 AND L12
L65 45792 SEA DROPLET? OR MICRODROPLET?
L66 25022 SEA DROPLET? OR MICRODROPLET?
L67 9139 SEA DROPLET? OR MICRODROPLET?
TOTAL FOR ALL FILES
L68 79953 SEA DROPLET? OR MICRODROPLET?
L69 0 SEA L45 AND L65
L70 1 SEA L46 AND L66
L71 2 SEA L47 AND L67
TOTAL FOR ALL FILES
L72 3 SEA L48 AND L68
L73 221338 SEA DROP OR DROPS OR DROPLET? OR MICRODROP?
L74 130680 SEA DROP OR DROPS OR DROPLET? OR MICRODROP?
L75 80396 SEA DROP OR DROPS OR DROPLET? OR MICRODROP?
TOTAL FOR ALL FILES
L76 432414 SEA DROP OR DROPS OR DROPLET? OR MICRODROP?
L77 0 SEA L45 AND L73
L78 1 SEA L46 AND L74
L79 3 SEA L47 AND L75
TOTAL FOR ALL FILES
L80 4 SEA L48 AND L76
L81 70 SEA L41 AND (L33 OR L37)

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L82          113 SEA L42 AND (L34 OR L38)
L83          403 SEA L43 AND (L35 OR L39)
     TOTAL FOR ALL FILES
L84          586 SEA L44 AND (L36 OR L40)
L85            3 SEA L41 AND L33
L86            5 SEA L42 AND L34
L87           11 SEA L43 AND L35
     TOTAL FOR ALL FILES
L88           19 SEA L44 AND L36
L89           33 SEA L81 AND L9
L90           26 SEA L82 AND L10
L91           69 SEA L83 AND L11
     TOTAL FOR ALL FILES
L92          128 SEA L84 AND L12
L93            0 SEA L89 AND L21
L94            1 SEA L90 AND L22
L95            0 SEA L91 AND L23
     TOTAL FOR ALL FILES
L96            1 SEA L92 AND L24

     FILE 'HCA' ENTERED AT 14:54:59 ON 12 DEC 2002
L97            5 SEA L53 OR L85
L98           13 SEA (L45 OR L61) NOT L97

     FILE 'WPIX' ENTERED AT 14:56:06 ON 12 DEC 2002
L99           22 SEA L50 OR L54 OR L62 OR L70 OR L78 OR L86 OR L94
L100          15 SEA L46 NOT L99

     FILE 'JAPIO' ENTERED AT 14:58:23 ON 12 DEC 2002
L101          11 SEA L63 OR L71 OR L79
L102          10 SEA L87 NOT L101
L103          18 SEA L55 NOT (L101 OR L102)


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=> d l97 1-5 cbib abs hitind

L97  ANSWER 1 OF 5  HCA  COPYRIGHT 2002 ACS
137:265062  Electrostatic sepn. of particulates in flue
     gases and an apparatus therefor and a system thereof.
     Yoshiyama, Eiji; Shibata, Yasunori; Kinoshita, Tetsuhiro (Kawasaki
     Jukogyo Kabushiki Kaisha, Japan).  PCT Int. Appl. WO 2002076620 A1
     20021003, 48 pp.  DESIGNATED STATES: W:  JP, US; RW: AT, BE, CH, CY,
     DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR.
     (Japanese).  CODEN: PIXXD2.  APPLICATION: WO 2002-JP2878 20020326.
```

PRIORITY: JP 2001-89438 20010327.

AB An app. for **electrostatically** sepg. conductive particles and insulative particles which shows a shortening in sepg. time and in sepg. performance comprises an approx. flat bottom electrode mounted below, an approx. flat mesh electrode having many particle-penetrating **openings** mounted above with a specified interval from the bottom electrode, and a **DC** power source connected to at least one of the mesh electrode and the bottom electrode. A sepg. zone is formed between the bottom electrode and the mesh electrode by **impressing** a voltage across both the electrodes.

IC ICM B03C007-02

CC 48-1 (Unit Operations and Processes)
Section cross-reference(s): 60, 76

ST **electrostatic** sepn particulate flue **gas**

IT **Electrostatic** precipitation
Electrostatic precipitation apparatus
Flue **gases**
(**electrostatic** sepn. of particulate in flue **gas**
)

L97 ANSWER 2 OF 5 HCA COPYRIGHT 2002 ACS

135:54291 Fabrication of gated cathode structures using an in situ grown vertically aligned carbon nanofiber as a field emission element. Guillorn, M. A.; Simpson, M. L.; Bordonaro, G. J.; Merkulov, V. I.; Baylor, L. R.; Lowndes, D. H. (Department of Electrical and Computer Engineering, University of Tennessee, Knoxville, TN, 37996, USA). Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures, 19(2), 573-578 (English) 2001. CODEN: JVTBD9. ISSN: 0734-211X. Publisher: American Institute of Physics.

AB Vertically aligned C nanofibers (VACNFs) are extremely promising cathode materials for microfabricated field emission devices, due to their low threshold field to initiate electron emission, inherent stability, and ruggedness, and relative ease of fabrication at moderate growth temps. The authors report on a process for fabricating gated cathode structures that uses a single in situ grown C nanofiber as a field emission element. The **electrostatic** gating structure was fabricated using a combination of traditional micro- and nanofabrication techniques. High-resoln. electron beam lithog. was used to define the 1st layer of features consisting of catalyst sites for VACNF growth and alignment marks for subsequent photolithog. steps. Following metalization of these features, plasma enhanced CVD (PECVD) was used to deposit a 1-.mu.m-thick interlayer dielec. Photolithog. was then used to expose the gate electrode pattern consisting of 1 .mu.m **apertures** aligned to the buried catalyst sites. After metalizing the electrode pattern the structures were reactive ion **etched** until the buried catalyst sites were released. To complete the devices, a novel PECVD process using a **d**. **c**. acetylene/NH3/He plasma was used to grow single VACNFs inside the **electrostatic** gating structures. The issues assocd. with the fabrication of these devices are discussed along

with their potential applications.
CC 76-12 (Electric Phenomena)
IT Sputtering
(**etching**, reactive; fabrication of gated cathode structures using in situ grown vertically aligned carbon nanofiber as field emission element)
IT **Vapor** deposition process
(plasma; fabrication of gated cathode structures using in situ grown vertically aligned carbon nanofiber as field emission element)
IT **Etching**
(sputter, reactive; fabrication of gated cathode structures using in situ grown vertically aligned carbon nanofiber as field emission element)

L97 ANSWER 3 OF 5 HCA COPYRIGHT 2002 ACS
134:166983 Thermogravimetric analysis of the oxidation of CVD diamond films synthesized by **DC** plasma jet. Liu, Jingming; Huang, Tianbin; Lu, Fanxiu; Tang, Weizhong; Tong, Yumei (School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing, 100083, Peop. Rep. China). Jinshu Rechuli Xuebao, 21(4), 1-5 (Chinese) 2000. CODEN: JRXUDO. ISSN: 0254-587X. Publisher: Zhongguo Jixie Gongcheng Xuehui Rechuli Fenhui.
AB Oxidn. of polycryst. free standing diamond film in air at temp. up to 1073 K was investigated by thermogravimetry. The oxidn. rates were measured between 973 K to 1123 K, to det. an activation energy of 220 kJ/mol, which is similar to nature diamond. The diamond films before and after oxidn. were characterized by SEM. The oxidn. proceeds by **etching** preferentially grain boundary into th films, creating a highly porous structure. In end diamond films become a lot of spire-like monocryst. structure. Graphitization was not detected in partially oxidized samples by Raman.
CC 57-8 (Ceramics)
ST thermogravimetric analysis oxidn CVD diamond film **DC** plasma jet
IT **Vapor** deposition process
(chem.; thermogravimetric anal. of the oxidn. of CVD diamond films synthesized by **DC** plasma jet)
IT **Jets**
(plasma; thermogravimetric anal. of the oxidn. of CVD diamond films synthesized by **DC** plasma jet)
IT Films
Thermogravimetric analysis
(thermogravimetric anal. of the oxidn. of CVD diamond films synthesized by **DC** plasma jet)
IT 7782-40-3, Diamond, processes
(thermogravimetric anal. of the oxidn. of CVD diamond films synthesized by **DC** plasma jet)

L97 ANSWER 4 OF 5 HCA COPYRIGHT 2002 ACS
128:109613 Plasma **etch** reactor and method. Deornellas,

Stephen P.; Jerde, Leslie G.; Cofer, Alferd; Vail, Robert C.; Olson, Kurt A. (Tegal Corp., USA). PCT Int. Appl. WO 9800858 A1 19980108, 55 pp. DESIGNATED STATES: W: CA, CN, JP, KR; RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE. (English). CODEN: PIXXD2. APPLICATION: WO 1997-US917 19970123. PRIORITY: US 1996-675559 19960703.

AB A plasma **etch** reactor includes an upper electrode, a lower electrode, and a peripheral ring electrode disposed between them. The upper electrode is grounded, the peripheral electrode is powered by a high-frequency a.c. power supply, while the lower electrode is powered by a low-frequency a.c. power supply, as well as a **d.c.** power supply. The reactor chamber is configured with a solid source of **gaseous** species and a protruding baffle. A nozzle provides a jet stream of process **gases** to ensure uniformity of the process **gases** at the surface of a semiconductor wafer. The configuration of the plasma **etch** reactor enhances the range of densities for the plasma in the reactor, which range can be selected by adjusting more of the power supplies.

IC ICM H01L021-302

CC 76-11 (Electric Phenomena)

ST plasma **etching** reactor method; semiconductor plasma **etching** reactor method

IT Baffles
Electric conductors
Electric insulators
Electromagnets
Magnets
Nozzles
(plasma **etching** reactor contg.)

IT Oxides (inorganic), uses
(plasma **etching** reactor contg.)

IT **Etching**
(plasma; reactor and method for)

IT Electric generators
Electric generators
(power supplies; plasma **etching** reactor contg.)

IT Semiconductor materials
(reactor and method for plasma **etching** of wafers of)

IT 409-21-2, Silicon carbide (SiC), uses 1344-28-1, Alumina, uses 7429-90-5, Aluminum, uses 7631-86-9, Silica, uses 7782-42-5, Graphite, uses 12033-89-5, Silicon nitride (Si3N4), uses
(plasma **etching** reactor contg.)

L97 ANSWER 5 OF 5 HCA COPYRIGHT 2002 ACS

118:41773 Low pressure r.f. plasma jet - a new tool for surface processing. Bardos, L.; Berg, S. (Aangstroem Assoc. Thin Film Process., Uppsala Univ., Uppsala, S-751 21, Swed.). Surface and Coatings Technology, 54-55(1-3), 91-5 (English) 1992. CODEN: SCTEEJ. ISSN: 0257-8972.

AB An extremely reactive radio-frequency (r.f.) plasma jet system (RPJ) operating at **gas** pressures 10-1014 Pa is described. The

RPJ works as a hollow-cathode supplied by **d.c.** bias through the space-charge sheath surrounding the r.f. electrode provided by an appropriate **gas** nozzle. A simplified model of plasma jet generation is presented. Properties and parameters of the supersonically flowing and decaying plasma in the jet channel were measured by Langmuir probes and by optical emission spectroscopy. Radial and axial profiles of basic micro parameters of the jet channel are presented. The effect of the frequency of the r.f. generator (13.56 and 27.12 MHz) on the plasma jet properties is shown. The first results of depositions of hard cryst. C films, Si-C, and diamond films are presented with respect to process parameters. Conditions for the generation of an arc-type discharge in the RPJ system for reactive sputtering and **etching** are briefly characterized. As an example, N sputtering of the Ti jet nozzle for Ti-N film deposition into narrow tubes (diam. <10 mm) is described.

CC 49-11 (Industrial Inorganic Chemicals)
Section cross-reference(s): 47, 76

IT Plasma
(**jets** of, low-pressure radio-frequency, for surface processing)

IT **Jets**
(plasma, low-pressure radio-frequency, for surface processing)

=> file wpix
FILE 'WPIX' ENTERED AT 15:08:49 ON 12 DEC 2002
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FILE LAST UPDATED: 9 DEC 2002 <20021209/UP>
MOST RECENT DERWENT UPDATE: 200279 <200279/DW>
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

=> d l99 1-22 max

L99 ANSWER 1 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 2002-612777 [66] WPIX
DNN N2002-485323
TI Ceramic heater manufacture used in semiconductor device manufacture, involves forming notch on resistance heat-emitting element, so that notch formation area is comprised by only one current path.
DC U11 X25
PA (IBIG) IBIDEN CO LTD
CYC 1
PI JP 2002203666 A 20020719 (200266)* 16p H05B003-20
ADT JP 2002203666 A JP 2000-402864 20001228
PRAI JP 2000-402864 20001228
IC ICM H05B003-20
ICS H01L021-027; H01L021-66; H05B003-10
AB JP2002203666 A UPAB: 20021014
NOVELTY - A resistance heat-emitting element (12) with specific pattern, whose resistance value is adjustable, is formed on the

surface of a ceramic substrate. A notch (130) is formed on a portion of heat-emitting element by laser radiation, in parallel to **current** flow **direction**, so that the notch formation area is comprised by only one current path (140).

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for ceramic heater.

USE - For manufacture of ceramic heater (claimed) used for drying, sputtering, etc., in **etching** device, chemical **vapor** epitaxy device, etc., used in semiconductor device manufacture. And also for **electrostatic** chuck top plate for wafer probers, etc., used in inspection device.

ADVANTAGE - Since the resistance value of resistance heat-emitting element is adjusted by forming notch on the element, and notch formation area is comprised by one current path, repeated disconnection and temperature variation of heating surface are restrained.

DESCRIPTION OF DRAWING(S) - The figure shows a perspective diagram illustrating the formation of notch on resistance heat-emitting element by laser trimming. (Drawing includes non-English language text).

Resistance heat-emitting element 12

Notch 130

Current path 140

Dwg.3/11

FS EPI

FA AB; GI

MC EPI: U11-C04D; U11-C04E1; U11-F01B1; X25-B01B

L99 ANSWER 2 OF 22 WPIX (C) 2002 THOMSON DERWENT

AN 2002-392809 [42] WPIX

DNC C2002-110436

TI Field emitter for integrated circuit board of electron beam lithographic stepper, includes carbon containing tip grown from bottom of dielectric well using catalyst.

DC L03

IN BRITTON, C L; GUILLORN, M A; LOWNDES, D H; MERKULOV, V I; SIMPSON, M L

PA (UTBA-N) UT-BATTELLE LLC

CYC 96

PI US 2002024279 A1 20020228 (200242)* 21p H01J001-02

WO 2002019372 A2 20020307 (200242) EN H01J029-00

RW: AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

W: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

AU 2001083323 A 20020313 (200249) H01J029-00

ADT US 2002024279 A1 Provisional US 2000-228713P 20000829, US 2001-810531 20010315; WO 2002019372 A2 WO 2001-US25270 20010809; AU 2001083323 A AU 2001-83323 20010809

FDT AU 2001083323 A Based on WO 200219372
PRAI US 2000-228713P 20000829; US 2001-810531 20010315
IC ICM H01J001-02; H01J029-00
AB US2002024279 A UPAB: 20020704
NOVELTY - A field emitter has a carbon containing tip having a base located at a bottom of the dielectric well and extending away from the substrate (300). The carbon containing tip is grown from the bottom of the dielectric well using a catalyst that is introduced at the bottom of the dielectric well after the dielectric well is formed.

DETAILED DESCRIPTION - A field emitter comprises a substrate, an electrode structure, and a carbon containing tip. The electrode structure includes a dielectric layer having a dielectric well that is formed in the dielectric layer after the dielectric layer is deposited, and an extractor layer having an extractor **aperture**. The carbon containing tip has a base located at a bottom of the dielectric well and extending away from the substrate. It is grown from the bottom of the dielectric well using a catalyst that is introduced at the bottom of the dielectric well after the dielectric well is formed.

An INDEPENDENT CLAIM is also included for a method for making a field emitter comprising providing a substrate on a heater plate in a vacuum chamber, providing a carbon source **gas** and an **etchant gas**, heating the substrate with the heater plate, and fabricating a carbon containing tip on the substrate with the carbon source **gas** and the **etchant gas** using plasma enhanced chemical **vapor** deposition.

USE - The field emitter is used in integrated circuit board of electron beam lithographic stepper (claimed). It is also useful in flat panel displays, massively parallel digital **electrostatic** e-beam array lithography, and/or electron microscopy.

ADVANTAGE - The invention provides field emitters that do not need to be lithography defined, are non-metallic, have a high aspect ratio and a high geometrical enhancement factor, a low threshold field strength, and are relatively easy to fabricate. It improves quality and/or reduces costs.

DESCRIPTION OF DRAWING(S) - The figure is a schematic view of an electrode-emitter.

Substrate 300

Multiwall nanotube 360

Dwg.3G/13

TECH US 2002024279 A1UPTX: 20020704
TECHNOLOGY FOCUS - ELECTRONICS - Preferred Component: The carbon containing tip is carbon containing nanofiber, a carbon containing singlewall nanotube, or a carbon containing multiwall nanotube (360). The dielectric well is coincident with the extractor **aperture** and includes a concave sidewall. The base of carbon containing tip is at a center of the bottom of the dielectric well. A buffer layer is located between the substrate and the carbon containing tip. The heater plate includes an electrode.

Preferred Method: The catalyst is provided including coating the substrate with an electron beam resist, patterning the electron beam resist, depositing a buffer layer on the substrate, depositing the catalyst on the buffer layer, and removing the electron beam resist. It is heated to form multiple catalyst **droplets**. A buffer layer is deposited directly on the substrate before depositing the catalyst on the buffer layer. The fabricating step includes **direct current** glow discharge plasma enhanced chemical **vapor** deposition (PECVD), radio frequency PECVD, or microwave PECVD. The method further comprises applying a voltage bias to the substrate.

TECHNOLOGY FOCUS - INORGANIC CHEMISTRY - Preferred Component: The dielectric layer includes silica. The buffer layer includes titanium. The **etchant gas** includes ammonia. The catalyst includes nickel, iron, or cobalt.

TECHNOLOGY FOCUS - ORGANIC CHEMISTRY - Preferred Component: The carbon source **gas** includes acetylene.

FS CPI
FA AB; GI
MC CPI: L03-G05D

L99 ANSWER 3 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 2002-229569 [29] WPIX
DNN N2002-176544 DNC C2002-069840
TI Plasma assisted semiconductor substrate processing chamber with a number of electroconductive bridge preventing electrical arcing.
DC L03 U11 V05
IN BARNES, M; COX, M S; LAI, C; PANG, L L
PA (MATE-N) APPLIED MATERIALS INC
CYC 29
PI EP 1158568 A2 20011128 (200229)* EN 8p H01L021-00
R: AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR
US 6364958 B1 20020402 (200230) C23C016-00
KR 2001107727 A 20011207 (200236) H01L021-205
JP 2002151421 A 20020524 (200250) 19p H01L021-205
ADT EP 1158568 A2 EP 2001-111452 20010510; US 6364958 B1 US 2000-577104 20000524; KR 2001107727 A KR 2001-28674 20010524; JP 2002151421 A JP 2001-155676 20010524
PRAI US 2000-577104 20000524
IC ICM C23C016-00; H01L021-00; H01L021-205
ICS C23C016-458; C23C016-505; H01J009-00; H05H001-00; H05H001-46
AB EP 1158568 A UPAB: 20020508
NOVELTY - The chamber (100) comprises a number of electroconductive bridges (116) connecting a portion of a substrate support member (110) with a portion of the conductive chamber walls.
USE - Used for chemical **vapor** deposition chambers or **etch** chambers.
ADVANTAGE - The electroconductive members are positioned such that electrical arcing is prevented, the formation of one or more

standing waves is prevented and the formation of one or more RF nodes within the chamber is prevented.

DESCRIPTION OF DRAWING(S) - The diagram shows a cross-section side view of a plasma assisted chemical **vapor** deposition chamber with a number of bridges.

Bridges 116

RF power source 108

Substrate support member 110

Electrostatic chuck 151

DC power source 140

Dwg.1/3

TECH EP 1158568 A2 UPTX: 20020508

TECHNOLOGY FOCUS - MECHANICAL ENGINEERING - Preferred Processing Chamber: The chamber comprises an enclosure with a grounded sidewall, an RF power source (108) and a **DC** power source (140) coupled to a substrate support (110) and a number of electroconductive members (116) connecting part of the inner surface of the sidewall of the enclosure with part of the outer surface of the sidewall of the substrate support member. The substrate support comprises an **electrostatic** chuck (151). The electroconductive members are made of metal mesh.

FS CPI EPI

FA AB; GI

MC CPI: L04-C01B; L04-C07B; L04-D01

EPI: U11-C09C; V05-F05C

L99 ANSWER 4 OF 22 WPIX (C) 2002 THOMSON DERWENT

AN 2002-002863 [01] WPIX

DNN N2002-002129 DNC C2002-001421

TI Manufacture of transcription material for image forming device, involves adhering powder to coating material by **electrostatic** force formed by **direct current** electric field between electrode and earthed coated article.

DC A89 G08 P42 P84 S06

PA (CANO) CANON KK

CYC 1

PI JP 2001242722 A 20010907 (200201)* 10p G03G015-16

ADT JP 2001242722 A JP 2000-56103 20000301

PRAI JP 2000-56103 20000301

IC ICM G03G015-16

ICS B05D001-06; B05D005-06; G03G005-147; G03G021-00

AB JP2001242722 A UPAB: 20020105

NOVELTY - The surface of electrophotographic sensitive and/or transcription material is coated with fine powder particle to provide toner release property. The particle is charged by electrode (101) and adhered to coating material by **electrostatic** force formed by **direct current** electric field between electrode and earthed coated article, using powder **electrostatic** coating apparatus to form a transcription material.

USE - For manufacture of material e.g. transcription material

such as elastic belt used for photograph photosensitive material and transcription process which are used for electrical charging process in image forming device by electrophotographic system (claimed) such as copier, printer and fax.

ADVANTAGE - The method of coating fine powder particle to the surface of transcription material and photosensitive material to provide toner release property, is accurately performed. Hence the surface of the coated article is not damaged and inexpensive transcription material is obtained. The transcription material for image forming device is manufactured with uniform stability and efficient coating using powder **electrostatic** coating apparatus.

DESCRIPTION OF DRAWING(S) - The figure shows the model diagram of **electrostatic spray** coating method. (Drawing includes non-English language text).

Electrode 101

Coated article 103

Dwg.1/4

TECH JP 2001242722 AUPTX: 20020105

TECHNOLOGY FOCUS - MECHANICAL ENGINEERING - Preferred Apparatus: The powder **electrostatic** painting apparatus **spray** the powder particle according to **atomization** mechanism which is a corona discharge gun. The gun which conveys the powder particle is attached to air hose(s) which conveys only air. The distance between the gun and coated article (103) during coating is 50-350 mm. A powder dispensing apparatus is attached to the powder **electrostatic** painting apparatus. The electrophotographic sensitive material is rigid cylinder. Preferred Method: The powder particle is **atomized** by centrifugal force by rotating the tip at 500-3000 rpm in powder **electrostatic** painting apparatus under **atomization** pneumatic pressure of 150-490 kPa (0.5-4 kg/cm2). The powder particle is charged by applying voltage of -5 to -70 kV. A powder particle is supplied into the tank having **opening** in its upper part. At the same time, air is blown up from a bottom part and the particle is charged by **impressing** a voltage using the electrode, so that the powder particle is suspended on the tank. The surface of the coated article is smoothened and the suspended particle is adhered to the coated article by **electrostatic** force. Preferred Property: The specific surface area of powder particle is 20-500 m2.

FS CPI EPI GMPI

FA AB; GI

MC CPI: A12-L05C1; G06-E04; G06-G08
EPI: S06-A01B; S06-A01D

PLE UPA 20020508
[1.1] 018; P0000
[1.2] 018; ND01; ND07; Q9999 Q7909 Q7885; Q9999 Q8617-R Q8606; Q9999 Q8651 Q8606; B9999 B5414-R B5403 B5276; N9999 N7056 N7034 N7023; N9999 N7090 N7034 N7023; B9999 B3930-R B3838 B3747

L99 ANSWER 5 OF 22 WPIX (C) 2002 THOMSON DERWENT

AN 2001-360444 [38] WPIX
DNN N2001-262196
TI **Etching** apparatus for manufacturing semiconductor device, controls **opening** of gate valve to supply nitrogen **gas** from conveyance chamber to plasma processing chamber.
DC U11 X14
PA (TKEL) TOKYO ELECTRON LTD
CYC 2
PI JP 2001093884 A 20010406 (200138)* 7p H01L021-3065
KR 2001039900 A 20010515 (200167) H01L021-3065
ADT JP 2001093884 A JP 1999-268578 19990922; KR 2001039900 A KR 2000-54901 20000919
PRAI JP 1999-268578 19990922
IC ICM H01L021-3065
ICS C23F004-00; H01L021-68; H05H001-46
AB JP2001093884 A UPAB: 20010711
NOVELTY - Wafer (W) mounted on lower electrode (106) in plasma processing chamber (102) of **etching** apparatus (100), is **etched**. High **DC** voltage is **impressed** to **electrostatic** chuck (108) which holds the wafer, after **etching**. A controller (112) controls gate valve (G) to supply nitrogen **gas** of conveyance chamber (200) to processing chamber and moves electrode to conveyance position from plasma processing position after plasma processing.
DETAILED DESCRIPTION - High pressure is maintained inside plasma processing chamber. Conveyance chamber delivers process substance between processing chambers. The gate valve connects openably the processing chamber and conveying chamber airtightly. An INDEPENDENT CLAIM is also included for plasma processing method.
USE - For **etching** semiconductor wafer for manufacturing semiconductor device.
ADVANTAGE - Residual electric charge of processed substance is removable without changing the design. Prevents reduction in throughput, damage of processed substance by abnormal discharge while taking out the processed substance.
DESCRIPTION OF DRAWING(S) - The figure shows the rough sectional diagram of **etching** apparatus. (Drawing includes non-English language text).
Etching apparatus 100
Plasma processing chamber 102
Lower electrode 106
Electrostatic chuck 108
Controller 112
Conveyance chamber 200
gate valve G
Dwg.1/3
FS EPI
FA AB; GI
MC EPI: U11-C07A1; X14-F

L99 ANSWER 6 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 2001-280983 [29] WPIX

CR 1998-412930 [35]
DNN N2001-200345 DNC C2001-085292
TI Method for removing particulates from wafer surface in plasma processing chamber involves isolating a wafer-supporting electrode from ground and supplying bias voltage to electrode to **electrostatically** launch particulates from wafer surface.
DC L03 U11 V05
IN DORNFEST, C; GIRARD, G; GUPTA, A
PA (MATE-N) APPLIED MATERIALS INC
CYC 1
PI US 6214160 B1 20010410 (200129)* 4p C23F001-02
ADT US 6214160 B1 Div ex US 1996-740407 19961029, US 1998-74562 19980507
FDT US 6214160 B1 Div ex US 5779807
PRAI US 1996-740407 19961029; US 1998-74562 19980507
IC ICM C23F001-02
AB US 6214160 B UPAB: 20010528
NOVELTY - Particulates are **electrostatically** removed from wafer surface by isolating a normally grounded wafer-supporting electrode from the ground and simultaneously connecting a bias voltage generator to the electrode, which supplies sufficient bias voltage to **electrostatically** launch particulates from the surface of the wafer.

DETAILED DESCRIPTION - An apparatus for dislodging particulates from a semiconductor wafer surface in a plasma processing chamber comprises:

(a) a pair of independently powered electrodes, including a first electrode (14) to which power is applied to generate a plasma within the processing chamber, and a second electrode (16) which supports a semiconductor wafer (18) and to which power is applied to generate a bias on the wafer surface;

(b) a radiofrequency first power supply (10) applied to the first electrode;

(c) a second power supply (20) applied to the second electrode;

(d) a first switch (22) between the second power supply and the second electrode;

(e) a second switch (24) between the second electrode and the grounding source; and

(f) a controller (30) which works in combination with the switches, so that **electrostatic** forces in the wafer surface are varied to dislodge particles from the surface.

USE - The apparatus is used for removing particulates from semiconductor substrates in plasma processing chambers such as plasma enhanced chemical **vapor** deposition (PECVD), reactive ion **etch** (RIE) or sputter **etch** processing chambers.

DESCRIPTION OF DRAWING(S) - The diagram illustrates a simplified block diagram of the major components of a chemical **vapor** deposition processing chamber.

Radiofrequency generators 10, 20
Filter 12
Upper electrode 14
Lower electrode 16

Semiconductor wafer 18
Switches 22, 24
Controller 30
Control lines 32, 34
Dwg.1/1
TECH US 6214160 B1 UPTX: 20010528
TECHNOLOGY FOCUS - ELECTRICAL POWER AND ENERGY - Preferred Apparatus: The controller works in combination with the power supply to the first electrode, the first switch and the second switch, so that **electrostatic** forces on the wafer surface are varied.
The second power supply is a radiofrequency power supply. The second power supply is a **direct current** power supply.
The first and second electrodes are parallel to each other. A filter is placed between the second power supply and the electrode. The second power supply operates at a selective frequency of between 60 Hz and 13.56 MHz. The second power supply operates at 100 - 2000 V.
FS CPI EPI
FA AB; GI
MC CPI: L04-D04
EPI: U11-C09C; V05-F04G; V05-F05C; V05-F09

L99 ANSWER 7 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 2001-053502 [07] WPIX
DNC C2001-015257
TI Magnetron sputter apparatus for thin film forming in semiconductor manufacture, has non-reactive **gas** flow **nozzles** in the vacuum chamber directed towards the target which faces substrate.
DC L03
PA (HITA) HITACHI LTD
CYC 1
PI JP 2000273624 A 20001003 (200107)* 4p C23C014-34
ADT JP 2000273624 A JP 1999-79140 19990324
PRAI JP 1999-79140 19990324
IC ICM C23C014-34
AB JP2000273624 A UPAB: 20010202
NOVELTY - Target (21) is provided to sputter discharge to form film on surface of substrate (15). The magnet (22) is provided to generate the required magnetic field in the target and power supply (26) to **impress** a **DC** voltage to cause discharge from the target surface. The non-reactive **gas** supply **nozzles** (14) are sized and directed towards the target so as to increase **gas** molecule density around target surface.
USE - For film forming on substrates used in semiconductor manufacture.
ADVANTAGE - Ensures stable and uniform film forming as a low pressure is maintained around substrate and **gas** molecule density around target surface increased by directing **gas** nozzle towards the target.
DESCRIPTION OF DRAWING(S) - The figure shows the schematic sectional view of magnetron sputtering apparatus.
Nozzles 14

Substrate 15
Target 21
Magnet 22
Power supply 26
Dwg.1/3
FS CPI
FA AB; GI
MC CPI: L03-H04D

L99 ANSWER 8 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 2000-685878 [67] WPIX
DNN N2000-507003
TI **DC** Plasma arc generator for industrial applications e.g. for thinning of integrated circuit wafers, has high frequency power source capable of igniting arc which migrates sequentially through **nozzles**.
DC P55 U11 U24 V05 X14
IN HALAHAN, P; SINIAGUINE, O
PA (HALA-I) HALAHAN P; (SINI-I) SINIAGUINE O; (TRUS-N) TRUSI TECHNOLOGIES LLC
CYC 24
PI US 6121571 A 20000919 (200067)* 13p B23K009-00
WO 2001045130 A2 20010621 (200137) EN H01J000-00
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR
W: CN DE GB IL JP KR
ADT US 6121571 A US 1999-465989 19991216; WO 2001045130 A2 WO 2000-US33649 20001211
PRAI US 1999-465989 19991216
IC ICM B23K009-00; H01J000-00
AB US 6121571 A UPAB: 20001223
NOVELTY - Electrically conductive electrode (2a) and **nozzles** (4a,5a) are located, so that plasma **gas** blows through them. **Nozzles** are connected to parallel coupled resistor (9a) and capacitor (10a). **DC** power supply (1) and high frequency power source have their terminals connected to electrode and down stream nozzle, so that the power source is capable of igniting arc that migrates sequentially through the **nozzles**.

DETAILED DESCRIPTION - The resistor has at least one positive thermal coefficient resistor which increases passage of current, such that lowest electrical resistance for the arc migrates from one nozzle to another nozzle. The high frequency power is approximately 10 MHz with peak voltage of approximately 6,000 V. An INDEPENDENT CLAIM is also included for dual-jet **DC** plasma arc generator.

USE - **DC** plasma arc generator for industrial applications e.g. thinning of integrated circuit wafers by plasma **etching**. Used for electronic products e.g. cell phones, laptops, palm tops and smart cards.

ADVANTAGE - Provides plasma arc generator with more reliable and reproducible control of pulling out plasma arc. Reduces or eliminates metal transfer from electrode to proximate nozzle and

leads to more reliable plasma start-up and longer electrode life.
DESCRIPTION OF DRAWING(S) - The figure shows the schematic depiction of two-jet two nozzle plasma generator with high frequency ignition.
DC power supply 1
Electrically conductive electrode 2a
Nozzles 4a,5a
Resistor 9a
Capacitor 10a
Dwg.4/7
FS EPI GMPI
FA AB; GI
MC EPI: U11-C07A1; U11-C09C; U24-E02A; V05-F05C; V05-F05E5; V05-F08E1; X14-F02

L99 ANSWER 9 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 2000-632464 [61] WPIX
DNN N2000-468602 DNC C2000-190910
TI **Gas**-liquid mixing apparatus has drive shaft with impeller that stirs **gas** and liquid along processed liquid supply piping side and **DC** voltage source that **impresses** **DC** voltage between **nozzle** and earthing electrode.
DC J02 X25
PA (YASW) YASKAWA ELECTRIC CORP
CYC 1
PI JP 2000254464 A 20000919 (200061)* 4p B01F003-04
ADT JP 2000254464 A JP 1999-65829 19990312
PRAI JP 1999-65829 19990312
IC ICM B01F003-04
ICS B01F005-02; B01F013-10
ICA C02F001-24
AB JP2000254464 A UPAB: 20001128
NOVELTY - The **gas**-liquid mixing apparatus has a drive shaft (6) with an impeller (6b) along the processed liquid supply pipe side (2) which stirs the **gas**-liquid mixture. An earthing electrode (7) is provided in the leading end of the **gas** supply **nozzle** (3). The **DC** voltage source (8) is connected to the rear terminal of **nozzle** which **impresses** **DC** voltage between the **gas** supply **nozzle** and earthing electrode.
USE - To dissolve **gas** in liquid.
ADVANTAGE - The pressure loss is small even when the flow rate of processed liquid is high which reduces the burden to the processed liquid supply apparatus. High dissolution efficiency is obtained in the low flow rate of the liquid also by utilizing **electrostatic** force which forms fine **gas** bubbles.
DESCRIPTION OF DRAWING(S) - The figure shows the **gas** -liquid mixing apparatus.
Processed liquid supply pipe side 2
Gas supply **nozzle** 3
Drive shaft 6
Impeller 6b

Earthing electrode 7
Dwg.1/2
FS CPI EPI
FA AB; GI
MC CPI: J02-A02A
EPI: X25-J

L99 ANSWER 10 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 2000-526530 [48] WPIX
DNN N2000-389327 DNC C2000-156557
TI **Gas** delivery for plasma apparatus includes ionizer plate with **openings** aligned with **apertures** of **gas** delivery plate.
DC L03 V05 X14
IN JEFFRYES, A I
PA (TRIK-N) TRIKON HOLDINGS LTD
CYC 4
PI GB 2347686 A 20000913 (200048)* 13p C23C016-44
JP 2000306900 A 20001102 (200061) 5p H01L021-3065
KR 2001006748 A 20010126 (200152) H01L021-02
US 6468386 B1 20021022 (200273) H05H001-00
ADT GB 2347686 A GB 1999-5198 19990308; JP 2000306900 A JP 2000-68658 20000308; KR 2001006748 A KR 2000-11406 20000308; US 6468386 B1 US 2000-518141 20000303
PRAI GB 1999-5198 19990308
IC ICM C23C016-44; H01L021-02; H01L021-3065; H05H001-00
ICS C23C016-455; H01J037-32; H01L021-205; H05H001-46
AB GB 2347686 A UPAB: 20001001
NOVELTY - **Gas** delivery for plasma treatment apparatus has **gas** delivery plate (18) with **apertures** (20) extending across downstream end of plenum. Separate ionizer plate (19), next to downstream face of delivery plate has **openings** (21) aligned with the **apertures**. **Openings** in ionizer plate are larger than **apertures** in delivery plate. A secondary **gas** delivery plate is downstream of the ionizer plate.

USE - The **gas** delivery system is used for plasma **etching** or **vapor** deposition apparatus.

ADVANTAGE - **Openings** in the ionizer plate do not define the **gas** flow so they can be larger and more readily machined. The **gas** delivery plate need not be made from plasma resistant material and instead may be a material more suited to machining. The **gas** delivery plate, being conducting and earthed may act as a dark space shield. Also, it does not need to act as an electrode, so may be made from some other suitable material such as a ceramic. The **gas** delivery manifold can be made extremely thin, thus increasing the range of techniques used for forming the **apertures**, as it relies on the structural strength of the ionizer plate. If the **gas** delivery plate is made of a ceramic, it can be allowed to get hot without concerns about the seals between **gas** delivery plate and the casing defining the plenum.

DESCRIPTION OF DRAWING(S) - The figure shows the plasma reactor chamber and a cross section of the **shower head** for plasma delivery.
Shower head 14
Gas supplies 15,16
Gas delivery plate 18
Ionizer plate 19
Apertures 20
Divergent **openings** 21
Dwg.1,2/3

TECH GB 2347686 A UPTX: 20001001
TECHNOLOGY FOCUS - MECHANICAL ENGINEERING - Preferred **Gas** Delivery System: A heating and cooling device is incorporated between the plates. The upstream side of the ionizer plate is parallel to the **gas** delivery plate and the downstream side is frustoconical or dished to enhance plasma uniformity. The **gas** delivery plate is **D.C.** electrical conducting and is earthed. An RF supply is connected to the ionizer plate.

FS CPI EPI
FA AB; GI
MC CPI: L04-D04
EPI: V05-F05C; V05-F08D1; V05-F08E1; X14-F

L99 ANSWER 11 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1997-503362 [46] WPIX
DNN N1997-419526
TI Clamping semiconductor wafer on **electrostatic** chuck during plasma processing - using dynamic feedback where **DC** voltage level corresponding to **DC** bias level of wafer is derived from alternating current at chuck.
AW ESC.
DC U11
IN ATLAS, B V; CHEN, C; CHEN LIU, D R; JAFARIAN-TEHRANI, S I; JONES, P L; TOKUNAGA, K E; JAFARIAN-TEHRANI, S J; LIU, D R; JAFARIAN-TEHRANI, S
PA (LAMR-N) LAM RES CORP
CYC 77
PI WO 9737382 A1 19971009 (199746)* EN 32p H01L021-68
RW: AT BE CH DE DK EA ES FI FR GB GH GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG
W: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN YU
AU 9725831 A 19971022 (199808)
US 5812361 A 19980922 (199845) H02N013-00
EP 890189 A1 19990113 (199907) EN
R: AT BE CH DE ES FR GB IE IT LI NL
JP 2000507745 W 20000620 (200036) 34p H01L021-68
KR 2000005101 A 20000125 (200061) H01L021-68
IL 126394 A 20010808 (200157) H01L021-68

ADT WO 9737382 A1 WO 1997-US4273 19970319; AU 9725831 A AU 1997-25831 19970319; US 5812361 A US 1996-624988 19960329; EP 890189 A1 EP 1997-917540 19970319, WO 1997-US4273 19970319; JP 2000507745 W JP 1997-535294 19970319, WO 1997-US4273 19970319; KR 2000005101 A WO 1997-US4273 19970319, KR 1998-707739 19980929; IL 126394 A IL 1997-126394 19970319

FDT AU 9725831 A Based on WO 9737382; EP 890189 A1 Based on WO 9737382; JP 2000507745 W Based on WO 9737382; KR 2000005101 A Based on WO 9737382; IL 126394 A Based on WO 9737382

PRAI US 1996-624988 19960329

REP 3.Jnl.Ref; JP 6232089; JP 6326176; US 5325261; US 5350479; US 5459632; US 5557215

IC ICM H01L021-68; H02N013-00
ICS B25J015-06

AB WO 9737382 A UPAB: 19971119
The wafer bias sensor(400) is coupled to an **electrostatic** chuck(302) and senses an alternating current signal. The sensor outputs, in response, a **direct current** voltage level corresponding to a **direct current** bias level of the wafer. A variable power supply (412) supplies a potential level to the chuck.

The potential level is modified in response to the **direct current** voltage level. This maintains a predetermined potential difference between the chuck and the part of the wafer overlying it irrespective of **direct current** bias.

USE/ADVANTAGE - For **etching**, oxidation, anodisation and chemical **vapour** deposition. For plasma processing. Potential difference between chuck and wafer constant between process steps reducing dielectric breakdown or pit mark damage.
Dwg.4/10

FS EPI

FA AB; GI

MC EPI: U11-C01B; U11-C05B1; U11-C07A1; U11-F02A2

L99 ANSWER 12 OF 22 WPIX (C) 2002 THOMSON DERWENT

AN 1997-473516 [44] WPIX

DNN N1997-394809

TI Semiconductor wafer chucking device - applying UV rays to feed ionised inert **gas** between wafer and wafer platform to neutralise charges and hair lifting pin for stripping part of wafer **electrostatically** absorbed on platform.

DC U11

IN YOSHIDA, H

PA (NIDE) NEC CORP; (NIDE) NIPPON ELECTRIC CO

CYC 6

PI	EP 798775 A2	19971001 (199744)*	EN 14p		H01L021-68
	R: DE FR GB				
	JP 09260475 A	19971003 (199750)	8p		H01L021-68
	KR 97067549 A	19971013 (199843)			H01L021-02
	US 6174370 B1	20010116 (200106)			C23C016-00
	JP 3163973 B2	20010508 (200128)	7p		H01L021-68

KR 298910 B 20011019 (200234) H01L021-02
ADT EP 798775 A2 EP 1997-105047 19970325; JP 09260475 A JP 1996-70339 19960326; KR 97067549 A KR 1997-10581 19970326; US 6174370 B1 US 1997-827312 19970326; JP 3163973 B2 JP 1996-70339 19960326; KR 298910 B KR 1997-10581 19970326
FDT JP 3163973 B2 Previous Publ. JP 09260475; KR 298910 B Previous Publ. KR 97067549
PRAI JP 1996-70339 19960326
REP No-SR.Pub
IC ICM C23C016-00; H01L021-02; H01L021-68
ICS H01L021-302
ICA B23Q003-15; H01L021-205; H01L021-3065
AB EP 798775 A UPAB: 19971105
The reactive ion **etching** apparatus is shown with wafer platform (1), opposed electrode (10), vacuum vessel (8), **gas inlet** (7), wafer (2), ESC power source (9) for applying a **DC** voltage to the platform and fixing the wafer to it by **electrostatic** absorption, wafer lift pin (3), half-lifting lift pin (4) for stripping part of the outer periphery of the wafer off the platform and UV applying unit (6).

Inert **gas** is led into vessel (8) via **gas** injecting **port** (7) and the UV ray is applied to the inside of the vessel. One wafer part is lifted and stripped off the platform and the other is absorbed on the platform by the residual absorption left on the outer periphery of the platform. The inert **gas** ionised by the UV ray has a neutralising effect on the charges on the rear surface of the wafer and the top of the wafer platform, so residual absorption is quickly reduced.

USE - Device is for chucking a semiconductor wafer and stripping it.

Dwg.1/7
FS EPI
FA AB; GI
MC EPI: U11-C03J2A; U11-C06A1B; U11-C07A1; U11-F02A2

L99 ANSWER 13 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1996-362941 [36] WPIX
DNN N1996-305920
TI Plasma flow generating device - has solenoids with regulated magnetic fields to control positions of plasma streams and of common formed plasma flow.
DC X14
IN SINYAGIN, O V
PA (AZRE-R) AZ RES PRODN STOCK CO
CYC 19
PI WO 9623394 A1 19960801 (199636)* RU 18p H05H001-50
RW: AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE
W: CA JP KR
ADT WO 9623394 A1 WO 1995-RU11 19950126
PRAI WO 1995-RU11 19950126
REP GB 1525393; WO 8901281; WO 9212273; WO 9212610; WO 9316573
IC ICM H05H001-50

ICS H05B007-22
AB WO 9623394 A UPAB: 19960913
Gas is passed through pipes (6) into electrode units (1) and out of **nozzles** (3), while a **DC** electro-arc discharge is ignited between the central electrodes (4) in each pair of electrode units using current sources (7). Each of the electrode units generates a plasma stream, which are combined to form a common plasma flow and the magnetic forces of the plasma stream act on the other streams, to deflect each stream.
When electric current is passed from sources (15) to solenoids (14), magnetic fields are formed around each stream between the ends of poles (13) and a magnetic hub (16) and the currents in the solenoids are regulated, to set the position of each stream relative to the 3-dimensional axis of symmetry (11) of the device. The streams can be moved along the Y direction during an unchanging position in the X direction by altering the ratio of the currents in the solenoids during an unchanging value of the sum of the currents.
USE/ADVANTAGE - Plasma processing of article surfaces, during **spraying** or deposition of films of various connections or during plasma **etching**. Better life of device and improved working characteristics.
Dwg.1/4
FS EPI
FA AB; GI
MC EPI: X14-F

L99 ANSWER 14 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1995-356893 [46] WPIX
DNN N1995-265071
TI **Electrostatic** chuck for semiconductor mfr. - has high-frequency electrode that **electrostatically** holds wafer in position in processing chamber when **DC** voltage is applied.
DC P56 U11 V05
PA (FUIT) FUJITSU LTD
CYC 1
PI JP 07245336 A 19950919 (199546)* 6p H01L021-68
ADT JP 07245336 A JP 1994-33653 19940303
PRAI JP 1994-33653 19940303
IC ICM H01L021-68
ICS B23Q003-15; H01J037-317; H01L021-203; H01L021-265; H01L021-3065; H02N013-00
AB JP 07245336 A UPAB: 19951122
The device (2) has a high-frequency electrode (6) inside a processing chamber where a semiconductor wafer is positioned. **DC** voltage is applied to the electrode which induces statics.
The statics keeps the wafer in position. A ground electrode (5) is provided near the **port** (7) where plasma irradiated to a wafer is introduced.
USE/ADVANTAGE - For **etching**, chemical **vapour** deposition, PVD, and ion implantation. Reduces chance of forming

cracks on wafer without necessarily reducing adhesion. Reduces dust generation.
Dwg.2/4

FS EPI GMPI
FA AB; GI
MC EPI: U11-C02B1; U11-C09A; U11-C09C; U11-F02A2; V05-F04G; V05-F08D3

L99 ANSWER 15 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1995-210424 [28] WPIX
CR 1995-188900 [25]; 1995-188901 [25]; 1995-188902 [25]; 1995-210294 [28]; 1995-210295 [28]; 1995-210423 [28]; 1995-210425 [28]; 1995-210426 [28]; 1995-258609 [34]; 1996-007943 [01]; 1998-390698 [34]; 1998-390699 [34]; 2002-543031 [58]; 2002-715781 [78]
DNN N1995-165052
TI Control method of plasma processing appts. - involves supplying heat transfer medium between semiconductor substrate and **electrostatic** chuck.
DC L03 M13 U11 V05 X14
IN ISHII, N
PA (TKEL) TOKYO ELECTRON LTD
CYC 3

PI	JP 07122544	A	19950512 (199528)*	16p	H01L021-3065
	US 5529657	A	19960625 (199631)	32p	H05H001-00
	KR 264445	B1	20001101 (200139)		H01L000-00
	JP 3193815	B2	20010730 (200146)	16p	H01L021-3065

ADT JP 07122544 A JP 1993-284207 19931020; US 5529657 A US 1994-317490 19941004; KR 264445 B1 KR 1994-25300 19941004; JP 3193815 B2 JP 1993-284207 19931020
FDT JP 3193815 B2 Previous Publ. JP 07122544
PRAI JP 1993-284207 19931020; JP 1993-273138 19931004; JP 1993-273139 19931004; JP 1993-273140 19931004; JP 1993-284211 19931020
IC ICM H01L000-00; H01L021-3065; H05H001-00
ICS C23C016-509; H01L021-68
AB JP 07122544 A UPAB: 20021209
The control method of plasma processing appts. (1) involves applying a **DC** voltage to an **electrostatic** chuck during plasma processing. The **electrostatic** chuck carries out the suction of a semiconductor substrate on a position stand (4). A high frequency antenna (6) is placed outside a processing receptacle (2) through an insulating material (5). The plasma is excited in the processing receptacle, by applying a high frequency power from a high frequency power supply (7) to the high frequency antenna. A heat transfer medium is supplied to the rear surface of the semiconductor substrate after stabilising the suction by the **electrostatic** chuck.
ADVANTAGE - Avoids separation of semiconductor substrate from **electrostatic** chuck due to supply pressure power of heat transfer medium and even when holding power of **electrostatic** chuck is reduced by scram of plasma. Performs **etching** process.
Dwg.2/16
ABEQ US 5529657 A UPAB: 19960808

A plasma processing appts. comprising: a chamber having a **gas inlet port** and a **gas** discharge **port**; supporting device, disposed in the chamber, for supporting an object to be processed which has a surface to be processed; a flat coil provided to oppose the surface to be processed of the object which is supported by the supporting device, with a gap between them; RF power supply device for supplying an RF current to the coil, thereby generating a plasma in the chamber between the coil and the supporting device; and directing device, provided to the supporting device to surround the object to be processed, and having a projecting portion projecting toward the coil past the surface to be processed of the object to be processed, and including an electrical insulator or a high resistance, for focussing the plasma in a direction parallel to the surface of the object to be processed; where the directing device has an outer annular member consisting of an electrical insulator or a high ohmic resistance, and an inner annular member arranged between the outer annular member and the object to be processed and consisting of a conductor.

Dwg.1/31

FS CPI EPI
FA AB; GI
MC EPI: U11-C07A1; U11-C09C; U11-F02A2; V05-F04G; V05-F05C1; V05-F05E5; V05-F08E1

L99 ANSWER 16 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1995-197453 [26] WPIX
DNN N1995-154971
TI Plasma processing method, such as dry **etching** and chemical **vapour** deposition - removing residual electric charge on unipolar **electrostatic** chuck through substrate biassing.
DC U11
PA (SONY) SONY CORP
CYC 1
PI JP 07115085 A 19950502 (199526)* 8p H01L021-3065
JP 3319083 B2 20020826 (200263) 8p H01L021-3065
ADT JP 07115085 A JP 1993-258614 19931015; JP 3319083 B2 JP 1993-258614 19931015
FDT JP 3319083 B2 Previous Publ. JP 07115085
PRAI JP 1993-258614 19931015
IC ICM H01L021-3065
ICS H01L021-205; H01L021-68
AB JP 07115085 A UPAB: 19950705
The method begins by suctioning a substrate using a single pole **electrostatic** chuck within a plasma (p) chamber where a substrate biasing device is placed. The next step involves plasma **gas** processing on the substrate while stopping the **DC** voltage supply (6) from the internal electrode (3) of the chuck mechanism.

The residual plasma **gas** that remains to the insulation (2) is removed by generating bias into the chamber. The substrate bias towards another electrode (7) is continued through an

RF power supply (11) while removing the residues on the insulation.
ADVANTAGE - Shortens residue removal time. Prevents substrate re-suction during reverse charge induction. Ensures maintenance of anisotropic shape during residue removal.
Dwg.1/12
FS EPI
FA AB; GI
MC EPI: U11-C07A1; U11-C09B; U11-C09C; U11-F02A2

L99 ANSWER 17 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1995-050710 [07] WPIX
DNN N1995-039844
TI Self testable capacitive pressure transducer, for use as microflow sensor e.g. in MBE - has solid state capacitor pressure chip and dedicated high performance circuit on chip which electronically creates **electrostatic** force for self testing.
DC S02 U12
IN CHO, S T; WISE, K D
PA (UNMI) UNIV MICHIGAN
CYC 1
PI US 5377524 A 19950103 (199507)* 14p G01F001-38
ADT US 5377524 A US 1992-902328 19920622
PRAI US 1992-902328 19920622
IC ICM G01F001-38
AB US 5377524 A UPAB: 19950223
The microflow transducer uses a differential capacitive pressure sensor to measure flow. Read-out electronics associated with the transducer feature a clocking speed of 100 KHz and drive loads up to 35 pF. The read-out electronics include a high **DC** gain that nulls out stray input capacitance, which is beneficial for the multichip realization of the microflow transducer.
The uncompensated linearity of the overall read-out electronics is 10 bits, and the pressure/flow resolution is 12 bits. An ultra sensitive membrane associated with the pressure sensor does not respond to a pulsed waveform for frequencies above 50 KHz. But for lower frequencies, it deflects in response to the time-average voltage applied across the capacitor plates of the pressure sensor. A self-test mode is provided which employs an extremely long pre-charge pulse.
USE/ADVANTAGE - Provides electronic read-out of a pressure sensor based ultra sensitive microflow transducer. In semiconductor manufacturing for control of pressure and/or **gas** flow, especially in low pressure applications such as molecular beam epitaxy, chemical **vapour** deposition (CVD) and reactive ion **etching** (RIE) where precision of flow control is in sub SCCM (standard cubic centimetres per minute) range. Provides electronic read-out circuit having range of at least 10 bits.
Dwg.4/11
FS EPI
FA AB; GI
MC EPI: S02-C01B4; S02-F04B2; S02-F04F; U12-B03E

L99 ANSWER 18 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1994-361516 [45] WPIX
DNN N1994-283391
TI **Electrostatic** attraction stage for temp. control of substrate - incorporates firing of **gas** introduced into substrate for dissociating it into plasma, and uses **dc** current to connect electrode with dielectric block.
DC U11
PA (SONY) SONY CORP
CYC 1
PI JP 06283595 A 19941007 (199445)* 8p H01L021-68
ADT JP 06283595 A JP 1993-93849 19930330
PRAI JP 1993-93849 19930330
IC ICM H01L021-68
ICS H01L021-302
AB JP 06283595 A UPAB: 19950102
The **electrostatic** attraction stage uses a **direct current** voltage **impression** unit (12) to connect an electrode with a dielectric block. The dielectric block positioned over the substrate has a **hole** to enable the introduction of auxiliary **gas**.

The exhaust electrode placed at a predetermined distance from the substrate has a voltage applied higher than the firing potential. The firing dissociates the **gas** into plasma between the surfaces of the substrate enabling undegraded pattern formation.

ADVANTAGE - Enhances efficiency of low temp. **etching** process. Performs sufficient reserve cooling of wafer before plasma processing. Avoids deterioration of selectivity resulting from main plasma during plasma processing.

Dwg.1/6
FS EPI
FA AB; GI
MC EPI: U11-F02A2

L99 ANSWER 19 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1990-131871 [17] WPIX
DNN N1990-102118 DNC C1990-057953
TI Wide-area vacuum UV lamp - used to generate disc-shaped plasma for CVD, **etching** etc..
DC L03 P42 U11 X14
IN COLLINS, G J; YU, Z
PA (ELEC-N) APPLIED ELECTRON CO
CYC 1
PI US 4910436 A 19900320 (199017)*
ADT US 4910436 A US 1988-155235 19880212
PRAI US 1988-155235 19880212
IC B05D003-06; C03C013-08; H05H001-02
AB US 4910436 A UPAB: 19930928
A wide-area vacuum ultraviolet (VUV). lamp comprises: a vacuum chamber; a ring-shaped cold cathode in the vacuum chamber, with a geometrically-shaped inner surface comprising a material which emits

secondary electrons efficiently and which gives min. cathode sputtering, the cathode having a cavity through which coolant may be circulated; a **DC** power supply to the cathode, for accelerating secondary electrodes emitted from the cathode inner surface and creating a ring-shaped electron beam a substrate for receiving the electron beam; a. VUV-reflecting top cap for directing VUV radiation to the substrate with a cavity through which coolant may be circulated; an extraction grid electrode to direct desired charged particles to the substrate; a retardation grid for retarding the flow of undesirable charged particles to the substrate; a bias grid electrode to steer desired charged particles to the substrate; a plate with a central aperture, to protect the substrate from contamination by cathode sputtering of impurities; purging **jets** for admitting purging **gas** to clean the cathode, and vacuum control and **gas** port devices.

USE/ADVANTAGE - The invention is used to provide a new source of VUV radiation and atomic radicals for CVD and thin film deposition, or for **etching**, doping, or polymerisation of microelectronic films. Lower substrate temps. are required than when using purely thermal methods. There is less radiation damage than with conventional plasma techniques.

1/2

FS CPI EPI GMPI
FA AB; GI
MC CPI: L04-D
EPI: U11-C01A9; U11-C01B; U11-C01J3; U11-C09C; X14-F

L99 ANSWER 20 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1990-034584 [05] WPIX
DNN N1990-026413 DNC C1990-015321
TI Fast atomic beam source with pointed iron anode magnet - cathode with ion neutralisation **nozzles**, and high voltage cathode.
DC K08 U11 X14
PA (NITE) NIPPON TELEGRAPH & TELEPHONE CORP
CYC 1
PI JP 01313897 A 19891219 (199005)* 4p
ADT JP 01313897 A JP 1988-145246 19880613
PRAI JP 1988-145246 19880613
IC G21K001-00; H01L021-30; H05H003-02
AB JP 01313897 A UPAB: 19930928
The source comprises a needle-shaped form anode consisting of pure iron, a first cathode having an ion neutralization nozzle arranged at the centre facing the anode and having many small holes around it and a second cathode arranged facing the first cathode and near the opposite side of the anode. A pipe feeds **gas** to the nozzle, and there is a magnet between the anode and the first cathode. A first **DC** power source charges positive high voltage to the anode, and a second **DC** power source charges negative high voltage to teh second cathode.

USE/ADVANTAGE - The beam source generates convergent fast atomic beam of low energy efficiently, which is used for making electronic element patterns on LSI materials by sputtering and

etching, etc. The beam has high convergence and can be used for pattern processing, secondary ion mass analysis, etc.
1/2
FS CPI EPI
FA AB; GI
MC CPI: K08-X
EPI: U11-C07A4; X14-G

L99 ANSWER 21 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1987-182334 [26] WPIX
DNN N1987-136390 DNC C1987-076071
TI Physical or chemical **vapour** deposition appts. - has dust collecting means around moving mechanisms.
DC M13 P41 U11
PA (NICV) NICHIDEN ANELVA KK
CYC 1
PI JP 62112790 A 19870523 (198726)* 3p
JP 07051756 B2 19950605 (199527) 3p C23F004-00
ADT JP 62112790 A JP 1985-251710 19851109; JP 07051756 B2 JP 1985-251710 19851109
FDT JP 07051756 B2 Based on JP 62112790
PRAI JP 1985-251710 19851109
IC B03C001-30; B03C003-00; C23C014-22; C23C016-50; C23F004-00; H01L021-68
AB JP 62112790 A UPAB: 19930922
Moving mechanisms of slidable, deformable or movable elements in the **vapour** deposition appts. held in a vacuum atmosphere have a kind of dust collecting means, such as **electrostatic** power generating means or magnetic field generating means. For example, a permanent magnet is provided near the bearing of the pulley driven by a belt, or, **direct current** high potential is **impressed** for the circuit of the covering means and the vacuum chamber wall to adhere the dust generated by the work sliding means onto the covering means.
USE - Detrimental fine dust is perfectly eliminated from the vacuum chamber.
1/3
FS CPI EPI GMPI
FA AB
MC CPI: M13-E07; M13-F
EPI: U11-C09X

L99 ANSWER 22 OF 22 WPIX (C) 2002 THOMSON DERWENT
AN 1981-16312D [10] WPIX
TI Forming of metallic mask on surface of plate glass contg. alkali met - by simultaneous de-alkalising and metal film forming.
DC L01 M13
PA (NIPG) NIPPON SHEET GLASS CO LTD
CYC 1
PI JP 55167153 A 19801226 (198110)*
PRAI JP 1979-73271 19790611
IC C03C017-24

AB JP 55167153 A UPAB: 19930915
Thin metallic mask having patterned **openings** is attached closely on one surface of glass plate contg. alkali metal, and electric pressure is **impressed** to the both surfaces of the glass plate by heating at a temp. above 100 deg.C so that positive voltage may come to the masked surface, then film is formed on the opened spaces of surface by normal method (e.g. evaporation). If necessary, insulating film is interlaid between the glass plate and the metallic mask. Metallic mask is desirable to have 30-300 microns of thickness, and is attached closely to the surface of glass plate by the **electrostatical** force. (usually several tens V-several KV is **impressed**.) Film (e.g. indium oxide film of 500 angstrom thick) is formed by evaporation, sputtering, **spraying** etc. Depth of dealkalized layer is desirable to be above 500 angstrom (pref. 1000 angstrom.).

Dealkalization from the surface of glass plate and formation of patterned film on it takes place at the same time. Prepn. of small glass plate for the use of electronic appliances is simplified by the application of **DC** voltage. Heat treatment of glass plate after its dealkalization is not necessary, therefore low alkali-concn. of the surface is retained semi-permanently. Prod. can be prepd. from inexpensive glass.

FS CPI
FA AB
MC CPI: L01-G03; L01-H; M13-F

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L101 ANSWER 1 OF 11 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 2001-347197 JAPIO
TITLE: COATING ROBOT FOR **ELECTROSTATIC** COATING
INVENTOR: AKUTSU TOMIO; MATSUYA KOICHI; UNO KEIZO; MASUYAMA KOTARO; NAKAYAMA TADAHIKO; OTSUKA MASAYOSHI; MAKINO KAZUYUKI; YOKOHARI YUKIO; OKADA TOMIO; SASAKI YOSHIKATSU; UCHIDA TETSUYA
PATENT ASSIGNEE(S): GAKUNAN CONSTRUCTION CO LTD
SAKURAI GIKEN KOGYO KK
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 2001347197	A	20011218	Heisei	B05B005-053

APPLICATION INFORMATION
STN FORMAT: JP 2000-174236 20000609
ORIGINAL: JP2000174236 Heisei
PRIORITY APPLN. INFO.: JP 2000-174236 20000609
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 2001

AN 2001-347197 JAPIO
AB PROBLEM TO BE SOLVED: To provide a coating robot for **electrostatic** coating, which is capable of preventing the scattering of coating material **droplets** to the surroundings as immediatately as possible in a coating work for a transmission tower.
SOLUTION: The coating robot 1 for **electrostatic** coating is for coating a material to be coated such as a pipe like material or the like as a frame work material for the tower. A robot body part 2 is provided with an arm part 4, which extends to surround the outside of the material to be coated and on which many **electrostatic** coating jetting nozzles 5 are arranged, and coating material supply means 10, 11 for supplying the **spray** coating material to each **electrostatic** coating jetting nozzle 5, an **electrostatic** controller 23 for **impressing DC** high voltage to each **electrostatic** coating jetting nozzle 5 and a control means 24 connected directly to a power source and for controlling the driving of the coating material supply means 10, 11 and the **electrostatic** controller 23 are incorporated in the robot body part 2.

IC ICM B05B005-053
ICS B05B012-00; B05B013-04; B05D001-04; B25J005-02

L101 ANSWER 2 OF 11 JAPIO
ACCESSION NUMBER: 1997-276734 JAPIO
TITLE: **ELECTROSTATIC** PRECIPITATOR
INVENTOR: YUKITAKE TSUGITA; KATO AKIRA; NANBA MASARU; TAKATSU YASUSHI; ASANUMA KUNIHIRO
PATENT ASSIGNEE(S): HITACHI LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 09276734	A	19971028	Heisei	B03C003-014

APPLICATION INFORMATION
STN FORMAT: JP 1996-90795 19960412
ORIGINAL: JP08090795 Heisei
PRIORITY APPLN. INFO.: JP 1996-90795 19960412
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1997

AN 1997-276734 JAPIO
AB PROBLEM TO BE SOLVED: To impart adhesion to dust and to prevent the

re-scattering of the dust in a two-stage **electrostatic** precipitator consisting of a charging part and a dust collecting part by providing a **spray** nozzle for **spraying** an aq. soln. on the **gas** inlet side of the precipitator and automatically **spraying** the soln. when the dust collection rate is decreased below a set value.
SOLUTION: When the precipitator is used in an automobile road tunnel, air and an aq. soln. are mixed by a **spraying** device 3 and **sprayed** into an exhaust **gas** introduced into the precipitator from a two-fluid **spray** nozzle, and hence the **droplet** is introduced into a charging part 1 along with the dust, passed through the field of a corona discharge generated by a **DC** high voltage **impressed** from a high-voltage power source 13 and charged. Subsequently, the duct and **droplet** are introduced into a dust collecting part 2 and collected on a collecting electrode 22 by the Coulomb force in a high electric field formed by a high-voltage power source 23. At this time, the dust concn. at the precipitator outlet is measured, the mixture is **sprayed** from the **spray** nozzle 31 when the concn. exceeds a specified value, and the rescattering is prevented.

IC ICM B03C003-014
ICS B03C003-013; B03C003-68

L101 ANSWER 3 OF 11 JAPIO
ACCESSION NUMBER: 1996-176855 JAPIO
TITLE: PLASMA TREATING DEVICE
INVENTOR: MATSUDA KOJI; SASAMURA YOSHITAKA
PATENT ASSIGNEE(S): NISSIN ELECTRIC CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 08176855	A	19960709	Heisei	C23F004-00

APPLICATION INFORMATION
STN FORMAT: JP 1994-323351 19941226
ORIGINAL: JP06323351 Heisei
PRIORITY APPLN. INFO.: JP 1994-323351 19941226
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1996
AN 1996-176855 JAPIO
AB PURPOSE: To maintain the specified uniformity of **etching** at every wafer by maintaining the specified degree of contact to suppress a change in a heat flow rate from the wafers to a lower electrode side regardless of the states of insulating films and wafers.
CONSTITUTION: The **gas** supplied from a mass flow controller 11 is filled into a space formed of a hole 1a of the lower electrode 1 opening at the rear surface of the wafer 4 and bellows 5. The **gas** on the front surface side (in the chamber) of the wafer

4 passes the spacing between the wafer 4 and the insulating film 3 and flows into the space described above when the degree of contact between both falls and the spacing is generated between both. As a result, a controller 14 raises a **DC** voltage when the **gaseous** pressure in the space measured by a pressure gage 13 **drops**. Consequently, the holding power (**electrostatic** power) of the wafer 4 by the lower electrode 1 is increased and the degree of contact described above is maintained constant.

IC ICM C23F004-00
ICS C23C016-50; H01L021-302; H05H001-46

L101 ANSWER 4 OF 11 JAPIO
ACCESSION NUMBER: 1993-142967 JAPIO
TITLE: IMAGE FORMING METHOD TO OPTICAL RECORDING MEDIUM
INVENTOR: OGURA KATSUYUKI; UEDA FUMIO
PATENT ASSIGNEE(S): DAINIPPON INK & CHEM INC
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 05142967	A	19930611	Heisei	G03G015-22

APPLICATION INFORMATION
STN FORMAT: JP 1991-310758 19911126
ORIGINAL: JP03310758 Heisei
PRIORITY APPLN. INFO.: JP 1991-310758 19911126
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1993

AN 1993-142967 JAPIO
AB PURPOSE: To provide the method which does not require intricate process, is suitable not only for production of many kinds in small quantities and can deal with diversified requirements by acting an electric field on an optical recording medium to form the **electrostatic** charge image meeting designs directly on the optical recording medium and developing and fixing the image. CONSTITUTION: The electric field is acted on the optical recording medium having a conductive **vapor** deposited metallic layer and dielectric protective layer on a dielectric substrate to form the **electrostatic** charge image directly on the surface of the optical recording medium. The **electrostatic** charge image is developed by a developer contg. coloring agents and fixer, by which the developed image is fixed. Namely, the optical recording medium is placed on an electrode substrate and a multistylus electrode is brought into direct contact with the dielectric protective layer and a **DC** voltage is **impressed** between the two electrodes, by which the **electrostatic** charge image is obtd. The **electrostatic** charge developing powder or liquid developer electrified to the polarity opposite from the polarity of the **electrostatic** charge is used for developing the **electrostatic** charge image. The heating of

the substrate or the drying of a solvent at ordinary temp. is merely necessitated to fix the developed image.
COPYRIGHT: (C)1993,JPO&Japio
IC ICM G03G015-22
ICS G03G009-08; G03G013-22; G11B023-40; H04N005-903

L101 ANSWER 5 OF 11 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1991-194948 JAPIO
TITLE: **ELECTROSTATIC** CHUCK
INVENTOR: NOZAWA TOSHIHISA
PATENT ASSIGNEE(S): TOKYO ELECTRON LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 03194948	A	19910826	Heisei	H01L021-68

APPLICATION INFORMATION
STN FORMAT: JP 1989-333592 19891222
ORIGINAL: JP01333592 Heisei
PRIORITY APPLN. INFO.: JP 1989-333592 19891222
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1991
AN 1991-194948 JAPIO
AB PURPOSE: To obtain an **electrostatic** chuck which can be used under the temperature condition ranging from a low temperature to a high temperature, by providing an insulating layer with which the surface of a susceptor main body is coated, and whose thermal expansion coefficient is nearly equal to that of the susceptor main body.
CONSTITUTION: An **electrostatic** chuck wherein an object 12 to be retained is retaind on a susceptor main body 30 by the effect of Coulomb's force is equipped with an insulating layer 32 with which the surface of the susceptor main body 30 is coated and whose thermal expansion coefficient is nearly equal to that of the susceptor main body 30. For example, in the case of an **electrostatic** chuck which is used as a semiconductor wafer mounting stand of a plasma **etching** equipment, the susceptor main body 30 is constituted of carbon, the insulating layer 32 is constituted of aluminum nitride, and the insulating layer 32 is stuck by CVD processing of **vapor** growth.
Electric power is supplied by removing a part of the insulating film 32 on the rear side, an RF power supply 34 is connected with said part, and a **DC** power supply 36 is connected via a filter 38 constituted of a coil L and a resistor C.
COPYRIGHT: (C)1991,JPO&Japio
IC ICM H01L021-68

L101 ANSWER 6 OF 11 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1990-153365 JAPIO
TITLE: ORIGINAL PLATE COPYING METHOD
INVENTOR: OBATA HIROYUKI; UCHIUMI MINORU

PATENT ASSIGNEE(S): DAINIPPON PRINTING CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 02153365	A	19900613	Heisei	G03G013-26

APPLICATION INFORMATION
STN FORMAT: JP 1988-308159 19881206
ORIGINAL: JP63308159 Showa
PRIORITY APPLN. INFO.: JP 1988-308159 19881206
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1990

AN 1990-153365 JAPIO
AB PURPOSE: To easily produce plural number of copies of a original plate at high speed by **impressing DC** voltage between the conductive part of the original plate and the electrode of a charge holding medium and forming a latent image corresponding to the pattern of the original plate on the above-mentioned medium. CONSTITUTION: As to the original plate 1, a pattern layer 12 consisting of an insulating part 12a and the conductive part 12b is formed on the electrode 11 and the electrode 22 and an insulating layer 21 are formed on a supporting body 23 in order by **vapor** deposition, etc., in the charge holding medium 2. The layer 12 of the original plate 1 is opposed to the layer 21 of the medium 2 in contact with or in non contact with each other and the **DC** voltage is **impressed** between the electrodes 11 and 22 by a power source 3. An **electrostatic** latent image corresponding to the pattern of the conductive part 12b is formed on the layer 21 with the aid of discharge between the conductive part 12b and the layer 21 caused by **impressing** the voltage, so as to copy the pattern of the original plate 1 on the medium 2. The obtained pattern is not only displayed on a CRT, etc., but also developed with toner.
COPYRIGHT: (C)1990,JPO&Japio
IC ICM G03G013-26

L101 ANSWER 7 OF 11 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1990-077578 JAPIO
TITLE: THIN FILM FORMING DEVICE
INVENTOR: HARADA SHIGERU
PATENT ASSIGNEE(S): MITSUBISHI ELECTRIC CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 02077578	A	19900316	Heisei	C23C016-44

APPLICATION INFORMATION
STN FORMAT: JP 1988-229307 19880912
ORIGINAL: JP63229307 Showa
PRIORITY APPLN. INFO.: JP 1988-229307 19880912

SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1990
AN 1990-077578 JAPIO
AB PURPOSE: To prevent the sticking of foreign matter to a substrate put in the reaction chamber of a chemical **vapor** growth device by **impressing** voltage on a prescribed electrode set in the chamber to **electrostatically** capture unnecessary particles.
CONSTITUTION: A substrate 6 to be treated is put in the reaction chamber 1 of a chemical **vapor** growth device and a **gas** 8 is introduced into the chamber 1 to form a thin film on the substrate 6 by chemical **vapor** growth. A prescribed electrode 21 is set in the chamber 1 and **DC** voltage is **impressed** on the electrode 21. Particles which do not contribute toward forming a thin film, e.g., electrically charged particles produced by collision in the **vapor** phase are removed by sticking to the electrode 21 and a high quality thin film is formed.

IC ICM C23C016-44
ICS H01L021-205; H01L021-31

L101 ANSWER 8 OF 11 JAPIO
ACCESSION NUMBER: 1987-145270 JAPIO
TITLE: ELECTROPHOTOGRAPHIC RECORDER
INVENTOR: KONNO TETSUO; KANAI YUTAKA; FUJITA TETSUYA
PATENT ASSIGNEE(S): SEIKOSHA CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 62145270	A	19870629	Showa	G03G015-16

APPLICATION INFORMATION
STN FORMAT: JP 1985-286456 19851219
ORIGINAL: JP60286456 Showa
PRIORITY APPLN. INFO.: JP 1985-286456 19851219
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1987
AN 1987-145270 JAPIO
AB PURPOSE: To prevent the dislodgment of the toner once sticking to recording paper and to improve imaging quality by providing a heating element to the surface of a counter electrode facing a toner transfer part.
CONSTITUTION: This recorder consists of the three layers; a transparent base 1, a transparent electrode 1b formed atop the base and a potoconductive layer 1c formed atop the transparent electrode. The transparent electrode 1b is biased to a negative voltage by a power source E<SB>1</SB>. The counter electrode 5 such as transfer roller electrode connected with a power source E<SB>2</SB> is disposed to face the toner transfer part 3 and the heating element 5a consisting of a thin film is provided on the surface of the

counter electrode 5 by **vapor** deposition of indium oxide In<SB>2</SB>O<SB>3</SB> ('NESA(R)') film. The heating element is heated when several tens volts of AC or **DC** voltage is **impressed** thereto through electrodes 5b, 5c provided at both ends thereof from an electrode 6 for heating. The toner is, therefore, melted by the effect of the heating element and is tentatively fixed to the recording paper when the toner **electrostatically** charged to the polarity reverse from the voltage **impressed** to the counter electrode is transferred to the recording paper by the effect of the counter electrode in the toner transfer part. The dropping and resplashing of the toner are thereby prevented.

IC ICM G03G015-16
ICS G03G015-00; G03G015-16; G03G015-20

L101 ANSWER 9 OF 11 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1984-222862 JAPIO
TITLE: DEVELOPING METHOD
INVENTOR: SUEMATSU HIROYUKI; IMAI EIICHI
PATENT ASSIGNEE(S): CANON INC
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 59222862	A	19841214	Showa	G03G015-08

APPLICATION INFORMATION
STN FORMAT: JP 1983-96511 19830531
ORIGINAL: JP58096511 Showa
PRIORITY APPLN. INFO.: JP 1983-96511 19830531
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1984

AN 1984-222862 JAPIO
AB PURPOSE: To obtain an always stable high quality image by using a nonmagnetic toner contg. a specified fine silica powder treated with a specified silane coupling agent and feeding it in a thin layer in a specified gap formed between a toner carrying body and an **electrostatic** image bearing body.
CONSTITUTION: A fine silica powder, such as "Aerosil 130", etc., made by Nippon Aerosil KK, produced by **vapor** phase oxidation of silicon halide is treated and stabilized with a silane coupling agent represented by formula I (R is alkoxy or Cl; m is 1∼3; Y is an N-contg. unsatd. heterocyclic compd. or its deriv.; and n is 3∼1.), such as one represented by formula II, is added to an insulating nonmagnetic toner to attach the fine silica powder to the surface of each toner particle. This toner thickness is maintained smaller than the distance between an **electrostatic** image bearing body 1 and a toner carrying body 2 in a developing region and AC and **DC** bias voltage are **impressed** between the body 1 and body 2 from a power supply 6 to develop the **electrostatic** latent image. As a result,

a high quality image is obtained throughout the range of low temp. and low humidity to high temp. and high humidity.
COPYRIGHT: (C)1984,JPO&Japio
IC ICM G03G015-08

L101 ANSWER 10 OF 11 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1984-045474 JAPIO
TITLE: COPYING DEVICE
INVENTOR: MOTOHASHI MITSUO
PATENT ASSIGNEE(S): KONISHIROKU PHOTO IND CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 59045474	A	19840314	Showa	G03G015-16

APPLICATION INFORMATION
STN FORMAT: JP 1982-156086 19820907
ORIGINAL: JP57156086 Showa
PRIORITY APPLN. INFO.: JP 1982-156086 19820907
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1984
AN 1984-045474 JAPIO
AB PURPOSE: To improve a transfer rate and to stabilize conveyance and sepn., by **impressing** the **DC** bias of the polarity reverse from the **electrostatic** charge on a photoreceptor in the stage of irradiation for pre-transfer exposing.
CONSTITUTION: A pre-transfer exposing lamp 10 is provided between a developing device 5 and a transfer electrode 7 at the circumferential edge of a photosensitive drum 1 of Se-Te. A transparent electrode 111 **vapor** deposited with palladium oxide is provided on a transparent substrate 11 to avoid shielding the irradiation light of the lamp 10 between the drum 1 and the lamp 10. The electrode 111 is so formed as to maintain 1mm space from the peripheral surface of the drum 1. A prescribed minus voltage is **impressed** from a **DC** power source V to the **impressing** means of the electrode 111 simultaneously with irradiation by the lamp 10, whereby the solid black image having high uniformity and 100% blacking area rate is obtd.
COPYRIGHT: (C)1984,JPO&Japio
IC ICM G03G015-16
ICS G03G021-00; G03G021-00

L101 ANSWER 11 OF 11 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1977-144384 JAPIO
TITLE: VACUUM EVAPORATION
INVENTOR: TEJIMA TORU; OINUMA NORIMASA; KATO KAZUHISA
PATENT ASSIGNEE(S): STANLEY ELECTRIC CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC

JP 52144384 A 19771201 Showa C23C013-00

APPLICATION INFORMATION
STN FORMAT: JP 1976-61635 19760527
ORIGINAL: JP51061635 Showa
PRIORITY APPLN. INFO.: JP 1976-61635 19760527
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1977

AN 1977-144384 JAPIO
AB PURPOSE: To generate the corona discharge and to perform the vacuum evaporation while conferring the directional property to the **vaporizing** substance, by **impressing** a high voltage of **direct** (alternate) **current** between the boat constituted so as to have the electrode of which the electric field intensity becomes larger to the direction of the substrate and the **electrostatically** shielded substrate, or between the substrate and the electrode.
COPYRIGHT: (C)1977,JPO&Japio
IC ICM C23C013-00

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L102 ANSWER 1 OF 10 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1994-087689 JAPIO
TITLE: METHOD AND DEVICE FOR PRODUCING DIAMOND
INVENTOR: IKEGAYA AKIHIKO; FUJIMORI NAOHARU; YOSHIKAWA MASANORI
PATENT ASSIGNEE(S): SUMITOMO ELECTRIC IND LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 06087689	A	19940329	Heisei	C30B029-04

APPLICATION INFORMATION
STN FORMAT: JP 1991-225100 19910809
ORIGINAL: JP03225100 Heisei
PRIORITY APPLN. INFO.: JP 1991-197109 19910710
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1994

AN 1994-087689 JAPIO
AB PURPOSE: To increase a thin film forming area by forming a transferable outer arc plasma jet among plural plasma torches and blowing a C-contg. raw **gas** or a mixture of the raw **gas** and H<SB>2</SB> against the confluence.
CONSTITUTION: A cathode torch 1 and an anode torches 2 to 4 are arranged in an evacuated vacuum chamber 9 so that the respective plasma **jets** are converged on one point, an inert **gas** such as Ar is passed between the cathode and anode in each plasma torch, and a **DC** voltage is **impressed** to generate a non-transferable **DC** plasma. A **DC**

voltage is then **impressed** between the cathode torch 1 and the anode torches 2 to 4 to form a transferable outer plasma jet between both torches, and plural plasma **jets** formed between the plural cathode and anode torches are joined. A C-contg. raw **gas** or a mixture of the raw **gas** and H<SB>2</SB> is blown against the confluent area from **gas** feed **nozzles** 5 to 7, the produced plasma jet is blown against the substrate 12, and a large- area diamond thin film is formed.

IC ICM C30B029-04
ICS C23C004-12

L102 ANSWER 2 OF 10 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1991-016676 JAPIO
TITLE: ELECTROSTATIC COATING METHOD
INVENTOR: NAKANO HIROBUMI; TANO YASUNORI; ITONAGA SHINICHI
PATENT ASSIGNEE(S): NIPPON STEEL CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 03016676	A	19910124	Heisei	B05D001-04

APPLICATION INFORMATION
STN FORMAT: JP 1989-150371 19890615
ORIGINAL: JP01150371 Heisei
PRIORITY APPLN. INFO.: JP 1989-150371 19890615
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1991

AN 1991-016676 JAPIO
AB PURPOSE: To prevent the generation of a leak current and to contrive the stabili zation of operations and the uniformization of coating by **spraying** the coating liquid of an intermediate storage tank supplied from a coating liquid supply tank from ejection **nozzles** which are cathode by a **spraying** method, **atomizing** the coating liquid by electrification and sticking the same to a material which is to be coated and is anode.
CONSTITUTION: A negative **DC** current is **impressed** between the anode of the material 1 to be coated and the cathode of coating liquid ejection **nozzles** 2 so that an electric field is generated between the two electrodes. The coating liquid of the coating liquid supply tank 4 is **sprayed** from a **spray** nozzle 5 to the intermediate storage tank 8 for the coating liquid by a pump 9 and is once stored therein. This coating liquid is ejected from the coating liquid ejection **nozzles** 2 by a pump 9. The coating liquid fed from the coating liquid supply tank 4 in such a manner is fed to the intermediate storage tank 8 for the coating liquid from the **spray** nozzle 5 in such a manner, i.e., a feed method of discontinuous mechanism is adopted, by which the leak current flowing from a high voltage part (intermediate storage tank 8 for the coating liquid) to an earth

part (coating liquid supply tank 4) is minimized as far as possible.
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IC ICM B05D001-04

L102 ANSWER 3 OF 10 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1990-224229 JAPIO
TITLE: **VAPOR** PHASE **ETCHING**
INVENTOR: YAMAZAKI SHUNPEI
PATENT ASSIGNEE(S): SEMICONDUCTOR ENERGY LAB CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 02224229	A	19900906	Heisei	H01L021-302

APPLICATION INFORMATION
STN FORMAT: JP 1989-282545 19891030
ORIGINAL: JP01282545 Heisei
PRIORITY APPLN. INFO.: JP 1989-282545 19891030
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1990
AN 1990-224229 JAPIO
AB PURPOSE: To facilitate anisotropic **etching** of a substrate or an object to be **etched** on the substrate by a method wherein reactive **gas** for **etching** is activated or decomposed by using electron cyclotron resonance and, further, a radio frequency or **DC** field is applied vertically to the substrate to be **etched** simultaneously.
CONSTITUTION: If argon is selected as non-product **gas** in order to generate resonance in a resonance space 2, a magnetic field determined by its mass and frequency is applied by a hollow coil and the argon **gas** is excited and pinched by the magnetic field **gas**, at the same time, resonated. After the argon **gas** is sufficiently excited, the argon **gas** is emitted into a reaction space 1 as electrons and excited argon **gas**. **Gas** for **etching** is emitted 22 to the exit of the space 1 from a plurality of annularly arranged **nozzles** 17 through the system 16 of a doping system 13. As a result, the **gas** for **etching** 22 is excited and activated by the non-product **gas** 21. Further, an electric field produced by a pair of electrodes 20 and 20' is applied to the reactive **gas** simultaneously. With this constitution, the activated **gas** flies along the electric field and the substrate is selectively **etched**.
COPYRIGHT: (C)1990,JPO&Japio
IC ICM H01L021-302
ICS C23F004-00

L102 ANSWER 4 OF 10 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1989-196828 JAPIO
TITLE: MANUFACTURE OF SEMICONDUCTOR DEVICE HAVING CARBON FILM FORMED THEREON

INVENTOR: YAMAZAKI SHUNPEI
PATENT ASSIGNEE(S): SEMICONDUCTOR ENERGY LAB CO LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01196828	A	19890808	Heisei	H01L021-302

APPLICATION INFORMATION
STN FORMAT: JP 1988-22382 19880201
ORIGINAL: JP63022382 Showa
PRIORITY APPLN. INFO.: JP 1988-22382 19880201
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989

AN 1989-196828 JAPIO
AB PURPOSE: To chemically stabilize a selective **etching** of carbon or a film containing as a main ingredient carbon by selectively removing the carbon or the film containing the carbon as the main ingredient by plasma oxidized **gas**.
CONSTITUTION: In a **gas** system 10, hydrogen as carrier **gas**, hydrocarbon **gas** as reactive **gas**, oxidized **gas** as **gas** for **etching** a carbon film, and fluoride **gas** as **etching** **gas** are respectively introduced through a valve 28, a flowrate meter 29 to the **nozzles** 25, 25' in a reaction system 30. A substrate or **gas** to be treated is fed from a preliminary chamber 5 into a reaction chamber 4 by opening a gate valve 6, reduced under pressure in the chamber 4 to grow a carbon film or to **etch** the film. In this case, electric energy is applied from a high frequency electrode 15, a matching transformer 16, and a **DC** bias power source 17 between a pair of electrodes 2 and 3 to generate a plasma 40, thereby improving the treatment speed.

IC ICM H01L021-302
ICS H01L021-314

L102 ANSWER 5 OF 10 JAPIO
ACCESSION NUMBER: 1989-164796 JAPIO
TITLE: METHOD FOR SYNTHESIZING DIAMOND MEMBRANE
INVENTOR: KAWARADA MOTONOBU; KURIHARA KAZUAKI; SASAKI KENICHI; ETSUNO NAGAAKI
PATENT ASSIGNEE(S): FUJITSU LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01164796	A	19890628	Heisei	C30B029-04

APPLICATION INFORMATION
STN FORMAT: JP 1987-320142 19871219
ORIGINAL: JP62320142 Showa

PRIORITY APPLN. INFO.: JP 1987-320142 19871219
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989

AN 1989-164796 JAPIO
AB PURPOSE: To stably synthesize the title homogenous membrane with high efficiency by using two plasma torches and making discharge **gas** high in discharge voltage to plasma with one torch and making **gaseous** reactive hydrocarbon low in discharge voltage to plasma with the other torch and allowing both plasma **jets** to collide with each other on a substrate.
CONSTITUTION: While feeding discharge **gas** (e.g., H<SB>2</SB>) high in discharge voltage between a cathode 14 and an anode 16, voltage is **impressed** with a **DC** electric source 18 to generate arc discharge and arc plasma is generated and also the above-mentioned **gas** fed to the arc plasma generating part of a plasma torch 12 is heated and activated and a plasma jet 20 is jetted. On the other hand, similarly **gaseous** reactive hydrocarbon (e.g., CH<SB>4</SB>) low in discharge voltage is made to plasma between a cathode 15 and an anode 17 and also the above- mentioned **gas** (e.g., CH<SB>4</SB>) fed to the arc plasma generating part of a plasma torch 13 is heated and activated and a plasma jet 21 is jetted. Then these plasma **jets** 20, 21 are allowed to collide on a base plate 23 such as silicon placed on a water-cooled substrate holder 22 and the title membrane is synthesized by quenching them.

IC ICM C30B029-04
ICS H01L021-205

L102 ANSWER 6 OF 10 JAPIO
ACCESSION NUMBER: 1989-087767 JAPIO
TITLE: FILM FORMING DEVICE BY LASER LIGHT
INVENTOR: NAKAMURA SUGURU; KINOSHITA JUNICHI; SASAKI MITSUO; MURASE AKIRA; YAMADA MINORU
PATENT ASSIGNEE(S): TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 01087767	A	19890331	Heisei	C23C014-28

APPLICATION INFORMATION
STN FORMAT: JP 1987-245999 19870930
ORIGINAL: JP62245999 Showa
PRIORITY APPLN. INFO.: JP 1987-245999 19870930
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1989

AN 1989-087767 JAPIO
AB PURPOSE: To optimize the respective effect of dissolving a powder material and the acceleration of the deposition of a metallic compd. on a substrate and to uniformize the energy density of laser beams by using 1st and 2nd laser projecting means so that the laser beams

are projected in the routes different from the supply route of the powder material.
CONSTITUTION: A **DC** high voltage is **impressed** between a substrate 22 and an electrode 34. **Gaseous** O<SB>2</SB> is simultaneously supplied from a cylinder 33 and the powder material is supplied from a supplying device 31 to respective **nozzles** 30 so that the powder material is ejected into a vacuum chamber 20 by the **gaseous** O<SB>2</SB>. The **gaseous** O<SB>2</SB> is activated by the glow discharge generated between the substrate 22 and an electrode 34 at this time and the substrate 22 is heated by supplying electric power from a power supply 24 to a heater 23. The laser beam is outputted from a light source 40 and is projected by the 1st projecting means 41 in the direction orthogonal with the supply directions of the **gaseous** O<SB>2</SB> and the powder material and the above-mentioned discharge direction to melt the powder material. Furthermore, the laser beam is projected from the direction different from the means 41 by the 2nd projecting means 45, by which the deposition of the metallic compd. on the substrate 22 is assisted.

IC ICM C23C014-28
ICS H01B013-00; H01L039-24
ICA C30B029-22; H01B012-06; H01L021-208

L102 ANSWER 7 OF 10 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1987-077478 JAPIO
TITLE: METHOD AND APPARATUS FOR PRODUCING THIN FILM BY PLASMA CHEMICAL **VAPOR** DEPOSITION
INVENTOR: MAKABE RYOJI; TABATA OSAMU; MOCHIZUKI SHOICHI; KIMURA SABURO; NAKAJIMA SADAO
PATENT ASSIGNEE(S): AGENCY OF IND SCIENCE & TECHNOL
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 62077478	A	19870409	Showa	C23C016-50

APPLICATION INFORMATION
STN FORMAT: JP 1985-218700 19850930
ORIGINAL: JP60218700 Showa
PRIORITY APPLN. INFO.: JP 1985-218700 19850930
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1987
AN 1987-077478 JAPIO
AB PURPOSE: To form a thin film having good coating property by immersing a substrate to be coated into a positive column of a discharge space contg. a **gaseous** raw material and forming the thin film consisting of the resultant product of plasma cracking of the **gaseous** raw material on the surface of the substrate to be coated.
CONSTITUTION: An upper electrode 2 of, for example, a two-electrode

device is adjusted with regard to a lower electrode 3 to the height at which comb **nozzles** 4, 5, an electric heater 7 and the substrate 10 to be coated can be satisfactorily housed. A **DC** voltage or high-frequency voltage is **impressed** to the electrodes by a discharge power source 11 to generate a cathode dark space 8 to the upper electrode 2 surface. The positive column 9 is imposed on the lower electrode 3 carrying a coating body 14. The body 10 is heated to about <=600°C by the heater 7 and the coating is executed by injecting the **gaseous** raw material from the **nozzles** 4, 5. The smooth coating is thus executed even to an insulating object such as glass and ceramics in the same manner as for the metallic substrate.

IC ICM C23C016-50

L102 ANSWER 8 OF 10 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1985-202757 JAPIO
TITLE: CONTROL DEVICE FOR WET PROCESS ELECTRICAL DUST PRECIPITATOR
INVENTOR: KATAOKA FUKUTARO
PATENT ASSIGNEE(S): RYOWA KAKOKI KK
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 60202757	A	19851014	Showa	B03C003-68

APPLICATION INFORMATION
STN FORMAT: JP 1984-59270 19840327
ORIGINAL: JP59059270 Showa
PRIORITY APPLN. INFO.: JP 1984-59270 19840327
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1985

AN 1985-202757 JAPIO
AB PURPOSE: To improve dust collecting effect in a wet process electrical dust precipitator by constituting a control device of a charge voltage control circuit for charging the stabilized charge voltage for dust precipitating electrodes from a **DC** high-voltage power source on the secondary side of a voltage transformer to the water to be **sprayed** and an arc deetection and extinction circuit.
CONSTITUTION: A high resistor 8 for detecting a charge voltage is disposed between the connecting point 2 of an insulating pipe 3 in the segment A of a charge water passage and an electrical conduit pipe 51 and the ground. Said resistor emits an arc extinction command by discriminating whether an arc short circuit or normal spark flashover. The output voltage controlled to the input voltage for the primary side of a voltage transformer for a **DC** high-voltage power source by a charge voltage control circuit 9 and an arc detection and extinction circuit 10 is then applied to a **DC** high-voltage power source 4 to control the same. The flowing water supplied from a water feed pump 7 is made into charge

water by the **DC** high-voltage current **impressed** thereto and is released from **spray nozzles** 12 via an electrical conduit pipe toward dust precipitating electrode plate 13. **Gas** 14 contg. pulverous powder dust is deposited here together with the charged **spray** water onto the dust precipitating electrode plates by which the powder dust is captured. Clean **gas** 15 is discharged from the precipitator.

IC ICM B03C003-68
ICS B03C003-16

L102 ANSWER 9 OF 10 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1985-075344 JAPIO
TITLE: ELECTRIC DUST-COLLECTOR
INVENTOR: HARA KEIICHI
PATENT ASSIGNEE(S): HARA KEIICHI
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 60075344	A	19850427	Showa	B03C003-47

APPLICATION INFORMATION
STN FORMAT: JP 1983-183263 19830930
ORIGINAL: JP58183263 Showa
PRIORITY APPLN. INFO.: JP 1983-183263 19830930
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1985

AN 1985-075344 JAPIO
AB PURPOSE: To perform the dust-collection of high resistive dust and ignition substance easily by constituting a dust-collecting part in which two sheets of reticular bodies are placed side by side and also providing a nozzle **spraying** water between said bodies.
CONSTITUTION: A dust-collecting part 12 is constituted by providing side by side at a prescribed interval with two sheets of reticular bodies 15 composed of a net 14 extended on frame bodies 13, and a nozzle 16 for **spraying** water is provided between said bodies 15. An electric discharge part 17 in which electrically conductive plates 19 having saw-toothed parts 18 are provided side by side at a prescribed interval is placed side by side toward said parts 12. **D.C.** high voltage is **impressed** across said parts 12 and part 17 to generate corona discharge on each tip of the saw-toothed parts 18, and the **gas** containing dust is flowed in the direction shown by arrows. The dust is adsorbed by the reticular bodies 15, but back corona phenomena are generated in case of high resistive dust, therefore water is **sprayed** from the **nozzles** 16. After the **sprayed** bodies are electrically charged, these are attracted on said parts 12 to cover the surface of the nets 14 and the resistance value of the high resistive dust collected to the dust-collecting parts 12 is lowered and a stable dust-collection is

performed easily.
COPYRIGHT: (C)1985,JPO&Japio
IC ICM B03C003-47
ICS B03C003-78

L102 ANSWER 10 OF 10 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1983-168563 JAPIO
TITLE: DAMPENING DEVICE
INVENTOR: MATSUMOTO YOICHI; SAKAMOTO NOBORU
PATENT ASSIGNEE(S): MITSUBISHI HEAVY IND LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 58168563	A	19831004	Showa	B41F007-30

APPLICATION INFORMATION
STN FORMAT: JP 1982-53446 19820331
ORIGINAL: JP57053446 Showa
PRIORITY APPLN. INFO.: JP 1982-53446 19820331
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1983
AN 1983-168563 JAPIO
AB PURPOSE: To provide a dampening device capable of uniformly moistening a plate cylinder by such an arrangement wherein a water feeding mechanism having plural **nozzles** is arranged opposingly to a water vibrating roller and an electric field by a high **DC** voltage is formed between the water vibrating roller and the **nozzles**.
CONSTITUTION: Dampening water sent to **nozzles** 13 by a water feeding device 11 is mistified by an electric field formed by a high **DC** voltage between the **nozzles** 13 and a water vibrating roller 12 and **mists** of water are conveyed to the water vibrating roller 12 and a uniform moistening surface is formed on the roller 12 and then the surface of water is supplied to a plate cylinder through a dampening roller. To **impress** a high voltage, a source of high **DC** voltage 14 is connected to a metal electrode layer 15 inside the roller 12 and the nozzle side is earthed and a difference in potential is made between the roller and the **nozzles** 13.
COPYRIGHT: (C)1983,JPO&Japio
IC ICM B41F007-30

=> d his l104-

FILE 'JAPIO' ENTERED AT 15:09:16 ON 12 DEC 2002
L104 6 S L103 NOT IMPRESS?

=> d l104 1-6 ibib abs ind

L104 ANSWER 1 OF 6 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1994-267899 JAPIO
TITLE: **ETCHING** DEVICE
INVENTOR: TAKUBI ATSUSHI
PATENT ASSIGNEE(S): NIPPON STEEL CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 06267899	A	19940922	Heisei	H01L021-302

APPLICATION INFORMATION
STN FORMAT: JP 1993-82680 19930316
ORIGINAL: JP05082680 Heisei
PRIORITY APPLN. INFO.: JP 1993-82680 19930316
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1994

AN 1994-267899 JAPIO
AB PURPOSE: To eliminate static electricity from a substrate in a short time after **etching** so that the substrate can be quickly removed from a stage by supplying an ionized **gas** carrying charges of the polarity different from that of the charges of the substrate.
CONSTITUTION: After the **etching** of a substrate 5 is completed, the generation of plasma is stopped by turning off a high-frequency power source 8 and **DC** power source 9. Then the supply of a process **gas** and substrate cooling **gas** is stopped and charges are eliminated from the substrate 5 by supplying an ionized **gas** carrying charges of the polarity different from that of the charges of the substrate 5 to the rear surface of the substrate 5 through a passage 13 by means of an ionizing device 12. The process **gas**, substrate cooling **gas**, and ionized **gas** are always discharged from a reactor chamber 1 through an exhaust **port** 14. When the static electricity is eliminated from the substrate 5, the substrate 5 loses its attracting force and can be easily removed from an **electrostatic** attracting stage 4.
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IC ICM H01L021-302
ICS C23F004-00; H01L021-68

L104 ANSWER 2 OF 6 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1991-236255 JAPIO
TITLE: METHOD FOR REMOVING CHARGE FROM **ELECTROSTATIC** CHUCK
INVENTOR: TAKADA KAZUO; TSUBONE TSUNEHIKO; FUJII TAKASHI
PATENT ASSIGNEE(S): HITACHI LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 03236255	A	19911022	Heisei	H01L021-68

APPLICATION INFORMATION
STN FORMAT: JP 1990-31555 19900214
ORIGINAL: JP02031555 Heisei
PRIORITY APPLN. INFO.: JP 1990-31555 19900214
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1991

AN 1991-236255 JAPIO
AB PURPOSE: To facilitate the separation of a material to be treated without providing a special separating circuit and the like by changing the stop timings of a microwave for forming plasma and a **DC** voltage for **electrostatic** chucking.
CONSTITUTION: **Etching gas** is supplied into a vacuum treating chamber through a **gas** feeding **port** 3. The pressure in the vacuum treating chamber is reduced to the specified pressure, and the inside of the chamber is evacuated. A microwave from a magnetron 11 is introduced into a discharge tube 2 through a waveguide 9. A magnetic field is formed with a coil 10. The **etching gas** in the discharge tube 2 is transformed into plasma by the action of the electric field of the microwave and the magnetic field of the coil 10. A **DC** voltage is applied to an electrode 6 from a **DC** power supply 8. A wafer 5 is held by the electrode 6. After the **etching** is finished, the output of the **DC** power supply is stopped. The discharge is performed only with the microwave. Thus, electric charge accumulated on a dielectric 12 that is held by the electrode 6 can be removed.

IC ICM H01L021-68
ICS B01J003-00; B01J019-08; C23F004-00

L104 ANSWER 3 OF 6 JAPIO
ACCESSION NUMBER: 1991-003250 JAPIO
TITLE: SUBSTRATE HOLDER
INVENTOR: TANABE MASABUMI; KOMIYA SOICHI; HAYASHI TOSHIO
PATENT ASSIGNEE(S): ULVAC CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 03003250	A	19910109	Heisei	H01L021-68

APPLICATION INFORMATION
STN FORMAT: JP 1989-136867 19890530
ORIGINAL: JP01136867 Heisei
PRIORITY APPLN. INFO.: JP 1989-136867 19890530
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1991

AN 1991-003250 JAPIO
AB PURPOSE: To obtain a substrate holder capable of holding a plurality of materials under processing at the same time and useful to process compound semiconductor substrate by applying high voltage to an

electrostatic chuck electrode cooled with a water-cooled electrode and **electrostatically** adsorbing a dielectric tray, on which a material under processing is mounted, to the front of said **electrostatic** chuck electrode.
CONSTITUTION: **DC** high voltage is applied from a high-voltage **DC** power source 18 to the conductive patterns 12a and 12b of an **electrostatic** chuck electrode 3 to generate static electricity in the front of said **electrostatic** chuck electrode 3 and a tray 5 on which a material under processing 6 is mounted is **electrostatically** adsorbed thereto. Cooling **gas** is introduced into a vacuum chamber 2 through a flowing **hole** 8, a cooling **gas** introduction **hole** 14, and a cooling **gas** blowing **hole** 17 to cool the material under processing 6 through the tray 5. A current is passed from the power source to a water-cooled electrode 1 to generate plasma between said electrode and an anode and **etch** the material under processing 6.

IC ICM H01L021-68
ICS C23C014-50; C23C016-44; C23C016-50; C23F004-00; H01L021-205; H01L021-302; H01L021-31

L104 ANSWER 4 OF 6 JAPIO
ACCESSION NUMBER: 1990-224241 JAPIO
TITLE: **ETCHING** METHOD
INVENTOR: NAKAMURA MORITAKA; IIZUKA KATSUHIKO; KURIMOTO TAKASHI
PATENT ASSIGNEE(S): FUJITSU LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 02224241	A	19900906	Heisei	H01L021-302

APPLICATION INFORMATION
STN FORMAT: JP 1989-29296 19890208
ORIGINAL: JP01029296 Heisei
PRIORITY APPLN. INFO.: JP 1988-26654 19880209
PRIORITY APPLN. INFO.: JP 1988-286880 19881115
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1990
AN 1990-224241 JAPIO
AB PURPOSE: To reconcile high selection ratio of SiO<SB>2</SB> and width control and also to lessen dust generation by **etching** it at a specified wafer temperature, using bromine or hydrogen bromide.
CONSTITUTION: Specified voltage is applied to an **electrostatic** chuck 22 provided on an electrode 25 from a **DC** power source 24 through a low pass filter 23 so as to **electrostatically** adsorb a wafer 21. **Gas** of He, or the like at specified pressure is introduced from a **gas inlet** 31 into a space between the wafer 21 and the surface

of the **electrostatic** chuck 22 so as to improve heat conductivity, and an electrode 25 adjusts the temperature by cooling water 26. The temperature of the wafer 21 to be processed, which is placed in such a vacuum vessel 32, is kept in the range of -40°C to 50°C, and is brought into contact with the plasma of reaction **gas** which contains bromine or hydrogen bromine so as to do taper **etching**. Hereby, pattern width control is done highly accurately without generating dust, and it has selection ratio to the substratum, and the damage can be prevented.
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IC ICM H01L021-302

L104 ANSWER 5 OF 6 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1987-120932 JAPIO
TITLE: **ELECTROSTATIC** CHUCK
INVENTOR: TOKURA TSUNEMASA; OSHIO KOSUKE
PATENT ASSIGNEE(S): TOKUDA SEISAKUSHO LTD
TOSHIBA CORP
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 62120932	A	19870602	Showa	B23Q003-15

APPLICATION INFORMATION
STN FORMAT: JP 1985-260478 19851120
ORIGINAL: JP60260478 Showa
PRIORITY APPLN. INFO.: JP 1985-260478 19851120
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1987
AN 1987-120932 JAPIO
AB PURPOSE: To make a chucked work easily separable from a chucking electrode, by feeding the through **hole** installed in the chucking electrode pierced through, with **gas** via a pipe line, and energizing a piston in direction toward the chucked work. CONSTITUTION: After reactive ion **etching** is over, a high frequency power source 7 is turned off, and a **DC** power source 9 is turned off as well, then a support block 19 in an earth potential state is made to go up by an air cylinder 16, making it contact with a chucked work 24, and the electric charge accumulated in the chucked work 24 is made to escape through the support block 19. Next, a solenoid valve 13b is closed, while a solenoid valve 13a is opened for a specified period of time long, taking in **gas** of N<SB>2</SB> or the like from a branch pipe 12a, and with the pressure, a piston 25 is energized downward against pressing force of a spring 26. With this constitution, the chucked work 24 **electrostatically** chucked is separated from the underside of an electrode 3, thus the chucked work 24 can be set up on a receiving plate 21 of the cupport block 19.
COPYRIGHT: (C)1987,JPO&Japio
IC ICM B23Q003-15
ICS H01L021-68

L104 ANSWER 6 OF 6 JAPIO COPYRIGHT 2002 JPO
ACCESSION NUMBER: 1985-005539 JAPIO
TITLE: **ELECTROSTATIC** ABSORBER
INVENTOR: ABE NAOMICHI
PATENT ASSIGNEE(S): FUJITSU LTD
PATENT INFORMATION:

PATENT NO	KIND	DATE	ERA	MAIN IPC
JP 60005539	A	19850112	Showa	H01L021-68

APPLICATION INFORMATION
STN FORMAT: JP 1983-113219 19830623
ORIGINAL: JP58113219 Showa
PRIORITY APPLN. INFO.: JP 1983-113219 19830623
SOURCE: PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1985
AN 1985-005539 JAPIO
AB PURPOSE: To accelerate and automate the **etching** by adding a negative voltage applying circuit, and forcibly **opening** and isolating a specimen in a vacuum treating chamber. CONSTITUTION: Switches S'<SB>1</SB>, S'<SB>2</SB> are turned ON, positive and negative **DC** voltages are applied through high frequency cutting coils 15, 16 to plane electrodes 12, 13, an **electrostatic** voltage is induced on an insulating film 14, thereby attracting a specimen. Then, the specimen is released by adding an SA switch having an operating contact and an SR switch having a stationary contact to the voltage applying circuit, interlocked, turned ON, thereby applying a negative voltage to the both electrodes 12, 13. The remaining attracting force is eliminated by the negative potential of **gas** plasma, thereby instantaneously enabling to produce the specimen. Then, the S'<SB>1</SB>, S'<SB>2</SB> switches are turned OFF to turn the power source OFF, leakage switches S<SB>4</SB>, S<SB>5</SB> are closed to leak. Such a negative load applying circuit is added, thereby readily releasing the specimen and automating and accelerating the treating device.

IC ICM H01L021-68

=> file wpix
FILE 'WPIX' ENTERED AT 15:12:15 ON 12 DEC 2002

=> d l100 1-15 ti

L100 ANSWER 1 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Dielectric ceramic for laminated ceramic capacitor, includes perovskite-type crystal grains having core-shell structure and

specific mean particle diameter.

L100 ANSWER 2 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Plasma **etcher** for fabricating semiconductor.

L100 ANSWER 3 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Brush-less high voltage electrical generator for producing high energy external electro-dynamic field or continuous quasi-coherent **DC** corona or arc discharge of uniformed current density, comprises housing divided into distinct sections.

L100 ANSWER 4 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Dry **etching** system used in semiconductor device production, has reactor with **etching** chamber, static chuck supplied with **direct current** voltage, **gas** control system, plasma generator, and process controlling system.

L100 ANSWER 5 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Base mount stage for use during very large scale integrated circuits manufacture, comprises compounded aluminum base material and ceramic layers laminated with electrode inbetween them for **electrostatic** function.

L100 ANSWER 6 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI **Electrostatic** wafer holder used in plasma **etching** apparatus.

L100 ANSWER 7 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Plasma processing semiconductor wafer - involves raising and lowering wafer from **electrostatic** chuck using lifter pin and removing wafer from chuck after completion of process.

L100 ANSWER 8 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI **Electrostatic** adsorber for dry-**etching** apparatus.

L100 ANSWER 9 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI **Electrostatic** absorber for LCD substrate - adsorbs insulated substrate on adsorber due to **electrostatic** force caused due to electric charges generated by plasma.

L100 ANSWER 10 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Static electricity removal in semiconductor wafer through **electrostatic** holder - by comparing detected **gas** pressure on wafer backside and pressure set point after sequential introduction of helium **gas** to semiconductor wafer.

L100 ANSWER 11 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Dry **etching** device for semiconductor board surface - in which charge charged in **electrostatically** taking-up board and ionised **gas** with opposite charge are supplied to

board.

L100 ANSWER 12 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Catching foreign matter within exhaust **gas** from CVD appts. - using trap placed in exhaust pipe and comprising positive and negative poles.

L100 ANSWER 13 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI **Electrostatic** wafer chuck in dry **etching** or CVD appts. for dissipating ioniser charge - mounts wafer on processing chamber lower electrode connected to HF power source and **electrostatic** chuck **DC** source and dissipates charge on substrate by inert **gas** flow through ioniser NoAbstract.

L100 ANSWER 14 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Dry **etching** vacuum chamber for silicon substrates - has RF electrode covered by dielectric members and dielectric coated substrate supports, providing no direct path for plasma.

L100 ANSWER 15 OF 15 WPIX (C) 2002 THOMSON DERWENT
TI Reinforcing of garment-fabric panels - by printing underside with raster of flocked resin precursor with microfine extender additive.

=> d l100 2,4,6,8,10,11,14 max

L100 ANSWER 2 OF 15 WPIX (C) 2002 THOMSON DERWENT
AN 2002-652754 [70] WPIX
DNC C2002-183611
TI Plasma **etcher** for fabricating semiconductor.
DC L03 U11 V05
IN OH, J Y
PA (HYNI-N) HYNIX SEMICONDUCTOR INC
CYC 1
PI KR 2002029978 A 20020422 (200270)* 1p H01L021-3065
ADT KR 2002029978 A KR 2000-60663 20001016
PRAI KR 2000-60663 20001016
IC ICM H01L021-3065
AB KR2002029978 A UPAB: 20021031
NOVELTY - A plasma **etcher** for fabricating a semiconductor is provided to prevent an over-**etch** of a wafer and a pattern defect, by eliminating the need to remove remaining electric charges so that an element delaying the entire process time of a plasma **etch** process is eliminated.
DETAILED DESCRIPTION - A wafer is **etched** by plasma in a vacuum state in a reaction chamber. The wafer is fixed in an **electrostatic** chuck installed in the lower portion inside the reaction chamber. **Etch gas** is induced and distributed to an upper electrode installed inside the reaction chamber. Radio frequency (RF) power for generating plasma is applied to the upper electrode which is also connected to an RF power

applying unit. A **direct-current**(**DC**) high voltage applying unit applies a **DC** high voltage to the **electrostatic** chuck. A remaining charge removing unit for removing remaining charges charged in the **electrostatic** chuck and the wafer in a plasma **etch** process, is installed in the **electrostatic** chuck.
Dwg.0/10
FS CPI EPI
FA AB
MC CPI: L04-C07D; L04-D04
EPI: U11-C07A1; V05-F05C; V05-F08E1

L100 ANSWER 4 OF 15 WPIX (C) 2002 THOMSON DERWENT
AN 2002-254680 [30] WPIX
DNN N2002-196756 DNC C2002-076016
TI Dry **etching** system used in semiconductor device production, has reactor with **etching** chamber, static chuck supplied with **direct current** voltage, **gas** control system, plasma generator, and process controlling system.
DC L03 U11
IN SANGO, T
PA (NIDE) NEC CORP; (SANG-I) SANGO T
CYC 4
PI US 2001032707 A1 20011025 (200230)* 10p H01L021-302
GB 2363900 A 20020109 (200230) H01J037-32
JP 2001308065 A 20011102 (200230) 6p H01L021-3065
KR 2001098731 A 20011108 (200230) H01L021-3065
US 6391789 B2 20020521 (200239) H01L021-302
ADT US 2001032707 A1 US 2001-836649 20010417; GB 2363900 A GB 2001-9654 20010419; JP 2001308065 A JP 2000-118275 20000419; KR 2001098731 A KR 2001-21030 20010419; US 6391789 B2 US 2001-836649 20010417
PRAI JP 2000-118275 20000419
IC ICM H01J037-32; H01L021-302; H01L021-3065
ICS C23F004-00; H05H001-46
ICA H01L021-00
AB US2001032707 A UPAB: 20020513
NOVELTY - A dry **etching** system comprises a reactor having an **etching** chamber, a static chuck provided in the **etching** chamber and supplied with a **direct current** voltage, a **gas** control system, a plasma generator provided in the **etching** chamber, and a process controlling system.
DETAILED DESCRIPTION - A dry **etching** system includes:
(a) a reactor (10) having an **etching** chamber;
(b) a static chuck (6) in the **etching** chamber and supplied with a **direct current** voltage to **electrostatically** attract a single semiconductor wafer (20);
(c) a **gas** control system supplying a process **gas** to the **etching** chamber and maintaining the pressure of the process **gas** at a target range;
(d) a plasma generator in the **etching** chamber and

generating a plasma from the process **gas** in the vicinity of the single semiconductor wafer for a dry **etching**; and

(e) a process controlling system for supervising the dry **etching** and changing the **direct current** voltage between a standard value and a certain value different from the standard value on the basis of a place occupied by the single semiconductor wafer in a semiconductor wafer lot and a lapse time from the previous dry **etching**.

An INDEPENDENT CLAIM is also included for a method of dry **etching**, involving:

(i) conveying a single semiconductor wafer from a semiconductor wafer lot onto a static chuck;

(ii) determining a magnitude of a **direct current** voltage to be applied to the static chuck on the basis of a place occupied by the single semiconductor wafer in the semiconductor wafer lot and a lapse time from the previous dry **etching**;

(iii) getting ready for the dry **etching** through the application of the **direct current** voltage to the static chuck for **electrostatically** attracting the single semiconductor wafer to the static chuck; and

(iv) carrying out the dry **etching** on the single semiconductor wafer.

USE - Used in the production of semiconductor devices.

ADVANTAGE - The system achieves good reproducibility without sacrificing the throughput.

DESCRIPTION OF DRAWING(S) - The figure is a schematic cross sectional view showing the arrangement of the dry **etching** system.

Static chuck 6

Reactor 10

Semiconductor wafer 20

Dwg.3/5

TECH US 2001032707 A1UPTX: 20020513

TECHNOLOGY FOCUS - INSTRUMENTATION AND TESTING - Preferred Component: The process controlling system includes a source of data information, a data processor, and a **direct current** electric power source.

FS CPI EPI

FA AB; GI

MC CPI: L04-C07B; L04-D

EPI: U11-C07A1; U11-C09C

L100 ANSWER 6 OF 15 WPIX (C) 2002 THOMSON DERWENT

AN 2000-229884 [20] WPIX

DNN N2000-173091

TI **Electrostatic** wafer holder used in plasma **etching** apparatus.

DC P56 U11 V06

PA (KYUN) NEC KYUSHU LTD

CYC 1

PI JP 2000049145 A 20000218 (200020)* 4p H01L021-3065

ADT JP 2000049145 A JP 1998-213082 19980728
PRAI JP 1998-213082 19980728
IC ICM H01L021-3065
ICS B23Q003-15; H01L021-68; H02N013-00
AB JP2000049145 A UPAB: 20000426
NOVELTY - An insulating body (1), which has a wafer mounting surface, is attached to a lower electrode (3). An internal electrode (2) is embedded in the insulating body. A variable **DC** power supply (6) applies a positive voltage to the internal electrode. A dowel pin (5) is thrusted upwards and made to protrude from the insulating body in order to detach a wafer (11) from the insulating body.
DETAILED DESCRIPTION - A lower electrode (3) is provided with a manifold (4) through which a cooling **gas** for temperature control circulates. A heater (8) is embedded in the lower electrode. An INDEPENDENT CLAIM is also included for a wafer holding procedure.
USE - Used in plasma **etching** apparatus.
ADVANTAGE - Ensures reliable holding of wafer, thus wafer processing yield can be improved.
DESCRIPTION OF DRAWING(S) - The figure shows the explanatory sectional view of a wafer holder.
Insulating body 1
Internal electrode 2
Lower electrode 3
Manifold 4
Dowel pin 5
Variable **DC** power supply 6
Heater 8
Wafer 11
Dwg.1/3
FS EPI GMPI
FA AB; GI
MC EPI: U11-C09C; U11-F02A2; V06-M06F; V06-U11

L100 ANSWER 8 OF 15 WPIX (C) 2002 THOMSON DERWENT
AN 2000-029996 [03] WPIX
DNN N2000-023020
TI **Electrostatic** adsorber for dry-**etching** apparatus.
DC P56 U11
PA (MITQ) MITSUBISHI ELECTRIC CORP; (RYOD-N) RYODEN SEMICONDUCTOR SYSTEM ENG
CYC 1
PI JP 11297802 A 19991029 (200003)* H01L021-68
ADT JP 11297802 A JP 1998-95060 19980407
PRAI JP 1998-95060 19980407
IC ICM H01L021-68
ICS B23Q003-15; H01L021-3065; H02N013-00
AB JP 11297802 A UPAB: 20000118
NOVELTY - A pressure sensor (9) detects the pressure of cooling **gas** supplied between a processed semiconductor wafer (3) and a stage (2) via a cooling **gas** feed path (7). A controller

(12) regulates the output of a **DC** power supply (11) so that the pressure of cooling **gas** will become a predetermined value.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a dry-**etching** apparatus.

USE - For dry-**etching** apparatus.

ADVANTAGE - Enables adjusting the **electrostatic** adsorbing force, applied by stage to wafer, to predetermined value. Ensures highly precise measurement of temperature of wafer held by stage.

DESCRIPTION OF DRAWING(S) - The figure shows the schematic diagram of a dry-**etching** apparatus using the **electrostatic** adsorber.

Stage 2
Semiconductor wafer 3
Cooling **gas** feed path 7
Pressure sensor 9
DC power supply 11
Controller 12
Dwg.1/3

FS EPI GMPI
FA AB; GI
MC EPI: U11-C09C; U11-F02A2

L100 ANSWER 10 OF 15 WPIX (C) 2002 THOMSON DERWENT
AN 1996-214670 [22] WPIX
DNN N1996-180095
TI Static electricity removal in semiconductor wafer through **electrostatic** holder - by comparing detected **gas** pressure on wafer backside and pressure set point after sequential introduction of helium **gas** to semiconductor wafer.
AW **DC**.
DC P56 U11
PA (HITA) HITACHI LTD
CYC 1
PI JP 08078512 A 19960322 (199622)* 3p H01L021-68
ADT JP 08078512 A JP 1994-215575 19940909
PRAI JP 1994-215575 19940909
IC ICM H01L021-68
ICS B23Q003-15; H01L021-3065
AB JP 08078512 A UPAB: 19960604
The method involves placing an alumina insulating film (11) on aluminum electrode (10) to form an electrode for **electrostatic** attraction. A **direct current** power supply (13) that may switch to a negative or positive voltage is connected for application to the formed electrode. A helium **gas** is sequentially introduced to a wafer backside and the wafer **gas** pressure is detected for comparison with a provided pressure set point (21).

Both pressure levels have their corresponding voltage levels. The removal of static electricity ends when the detected **gas** pressure, converted to an equivalent voltage of opposite polarity

with respect to the set point voltage, equals the pressure set point.
USE/ADVANTAGE - Used in plasma appts. for wafer **etching** .Ensures wafer reliability through reliable removal of static electricity in semiconductor wafer.
Dwg.1/1
FS EPI GMPI
FA AB; GI
MC EPI: U11-C07A1; U11-C09C; U11-F02A2

L100 ANSWER 11 OF 15 WPIX (C) 2002 THOMSON DERWENT
AN 1994-345001 [43] WPIX
DNN N1994-270792 DNC C1994-156992
TI Dry **etching** device for semiconductor board surface - in which charge charged in **electrostatically** taking-up board and ionised **gas** with opposite charge are supplied to board.
DC L03 U11
PA (YAWA) NIPPON STEEL CORP
CYC 1
PI JP 06267899 A 19940922 (199443)* 3p H01L021-302
ADT JP 06267899 A JP 1993-82680 19930316
PRAI JP 1993-82680 19930316
IC ICM H01L021-302
ICS C23F004-00; H01L021-68
AB JP 06267899 A UPAB: 19941216
A charge charged on an **electrostatically** taking up board (5) and ionised **gas** with opposite charge are supplied to the board (5) for removal of the board (5) from a **DC** voltage **impressed** electrode (3a,3b) by neutralising the charge, to eliminate static electricity on the board (5) regardless of **etching** conditions.
USE/ADVANTAGE - Board is rapidly removed from the take-up stage after **etching**.
Dwg.1/1
FS CPI EPI
FA AB; GI
MC CPI: L04-C07B; L04-D06
EPI: U11-C07A1; U11-C09C

L100 ANSWER 14 OF 15 WPIX (C) 2002 THOMSON DERWENT
AN 1989-365856 [50] WPIX
DNN N1989-278299
TI Dry **etching** vacuum chamber for silicon substrates - has RF electrode covered by dielectric members and dielectric coated substrate supports, providing no direct path for plasma.
DC U11 V05
IN TAMAKI, T; TSUKADA, T; YOSHIDA, T
PA (NICV) ANELVA CORP; (NICV) NICHIDEN ANELVA KK
CYC 5
PI EP 346131 A 19891213 (198950)* EN 12p
R: DE FR GB

JP 01312087 A 19891215 (199005)
US 4968374 A 19901106 (199047)
ADT EP 346131 A EP 1989-305828 19890609; JP 01312087 A JP 1988-142629 19880609; US 4968374 A US 1989-359817 19890601
PRAI JP 1988-142629 19880609
REP 1.Jnl.Ref; A3...9103; No-SR.Pub; US 4399016; US 4400235; US 4520421
IC C23F001-02; C23F004-00; H01J037-32; H01L021-30
AB EP 346131 A UPAB: 19930923
Dry **etching** is effected in a vacuum chamber (1) having provision for **gas** entry (15), an earthed electrode (3), and an RF electrode (2). The upper surface of the latter is covered with removable conductive supports (4a) for substrates (9) for **etching**, and with removable dielectric members (6,7,8).

The exposed surfaces of the substrate support are covered with an insulating polyimide film (5). The support and dielectric members are arranged such that gaps in between provide no straight path for the plasma to the RF electrode surface. The latter electrode is provided with a negative **DC** voltage larger than the negative self-bias voltage at the substrate during operation.

ADVANTAGE - Combines **electrostatic** chucking with adequate cooling of the substrate being **etched**.

3/7
ABEQ US 4968374 A UPAB: 19930923
The dry **etching** apparatus has a vacuum chamber provided therein with an RF electrode. On the RF electrode an object substrate(s) The RF electrode is covered with a substrate bed(s) and detachable dielectric members. The substrate bed(s) includes a dielectric portion and a conductive portion provided just under the dielectric portion. The conductive portion is equipotential in terms of **direct current** to the RF electrode. At least one gap extension is consituted of a gap(s) between the dielectric members, a gap(s) between the dielectric members and the substrate bed(s), etc., and extends from the surface of the RF electrode to the plasma space.

The gap extension(s) extends zigzaggedly from the RF electrode to the plasma space so that the plasma space can not structurally be viewed from the surface of the RF electrode irrespective the dimensions of the substrate. To the RF electrode is applied a negative **DC** voltage having larger absolute value than that of a negative self-bias voltage at the object substrate(s) induced by plasma discharge.

USE - Semiconductor manufacture.
FS EPI
FA AB; GI
MC EPI: U11-C07A1; U11-C07D9; V05-F03; V05-F09; V05-M05

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L98 ANSWER 1 OF 13 HCA COPYRIGHT 2002 ACS
137:162476 Apparatus and method for plasma processing of a substrate utilizing an **electrostatic** chuck. Sill, Edward L.; Jones, William D.; Baldwin, Craig T. (Tokyo Electron Limited, Japan). U.S. US 6431112 B1 20020813, 10 pp., Cont. of U.S. Ser. No. 334,046. (English). CODEN: USXXAM. APPLICATION: US 2000-565606 20000504. PRIORITY: US 1999-334046 19990615.

AB The invention relates to a processing system for processing a substrate with a plasma comprises a processing chamber configured for contg. a plasma, a substrate support within the chamber, and a plurality of electrodes coupled to the substrate support. The electrodes are each positioned proximate the supporting surface and are elec. isolated from one another. An RF power source is coupled to each of the electrodes for biasing the electrodes, so that they are operable for creating a **d.c.** bias on a substrate positioned on the supporting surface. A first elec. capacitive structure is elec. coupled between the RF power source and at least one of the plurality of electrodes. The first elec. capacitive structure has a variable capacitance for varying the **DC** bias created on the substrate by the at least one electrode relative to the **d.c.** bias created on the substrate by at least one of the other electrodes of the plurality of electrodes. The varied **d.c.** bias thereby varies the effect of a plasma on one portion of the substrate relative to the effect of the plasma on another portion of the substrate.

IC ICM C23C016-509
ICS C23C016-503
NCL 118723000E
CC 76-11 (Electric Phenomena)
ST substrate plasma processing **electrostatic** chuck
IT Holders
(**electrostatic** chuck; substrate plasma processing app. with **electrostatic** chuck)
IT **Etching** apparatus
Vapor deposition apparatus
Vapor deposition process
(plasma; substrate plasma processing app. with **electrostatic** chuck)
IT Electric contacts
(substrate plasma processing app. with **electrostatic** chuck)

L98 ANSWER 2 OF 13 HCA COPYRIGHT 2002 ACS
132:182076 Method and apparatus for high-speed curtain coating. Nagashima, Katsusuke; Nakashima, Koji; Saito, Atsushi (Konica Co., Japan). Jpn. Kokai Tokkyo Koho JP 2000061381 A2 20000229, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-234356 19980820.
AB The title app. comprises a **gas** flow controller and an **electrostatic** charger, in which the **gas** flow controller regulates a **gas** flow to where a liq. and a support merges and the **electrostatic** charger controls charging of the support. The process is used to manuf. a photo film. The photog. film is transported by a backup roller **impressed** by a **d.c.** voltage. The process was able to apply a high-viscosity liq. to a support.
IC ICM B05C005-00
ICS B05D001-30; B05D003-14; G03C001-00; G03C001-74
CC 42-2 (Coatings, Inks, and Related Products)
Section cross-reference(s): 74

L98 ANSWER 3 OF 13 HCA COPYRIGHT 2002 ACS
132:8289 Plasma processing in lifting up wafers from an **electrostatic** chuck. Nagahata, Kazunori; Nonaka, Tatsu (Tokyo Electron, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11340208 A2 19991210 Heisei, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-161308 19980526.
AB The process involves feeding an inert **gas** into the chamber in continued **impression** of **d.c.** voltage on the processing semiconductor wafer thin film after completion of the plasma processing, terminating the **impression** of the voltage the wafer upon reaching the pressure to 100-500 mTorr, lowering the level of the electrode, and lifting the wafer up from the **electrostatic** chuck by lifter pins. The app. makes possible in lifting the wafers from the chuck without jumping.
IC ICM H01L021-3065
ICS C23F004-00; H01L021-205; H01L021-31; H05H001-46; C23C014-34;

C23C016-50
CC 76-11 (Electric Phenomena)
ST electrode lifting **electrostatic** chuck plasma app
IT Electrodes
(lifting; plasma processing in lifting up wafers from **electrostatic** chuck)
IT Semiconductor materials
(plasma processing of; plasma processing in lifting up wafers from **electrostatic** chuck)
IT Electric insulators
(polyimides; plasma processing in lifting up wafers from **electrostatic** chuck)
IT 7727-37-9, Nitrogen, uses
(inert **gas**; plasma processing in lifting up wafers from **electrostatic** chuck)

L98 ANSWER 4 OF 13 HCA COPYRIGHT 2002 ACS
127:143934 Substrate holders and plasma treatment apparatus and manufacture of semiconductor devices. Hasegawa, Akihiro (Fujitsu Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 09176860 A2 19970708 Heisei, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1995-337110 19951225.
AB The substrate holder has divided electrodes, to which a.c. powers different in frequency are supplied, and are buried in an insulator for treatment of semiconductor wafer(s) in a plasma treatment chamber. Disk form electrodes may be arranged to a concentric shape, and a **d.c.** power may be supplied to the electrons concurrently for **electrostatic** suction. Uniform **etching** or film deposition is made by appropriate adjustment of the frequencies of the a.c. powers and adjustment of distribution of neg. self bias voltages.
IC ICM C23C016-50
ICS C23F004-00; H01L021-205; H01L021-3065; H05H001-46
CC 76-11 (Electric Phenomena)
Section cross-reference(s): 75
IT **Etching** apparatus
Etching apparatus
Vapor deposition apparatus
(plasma; substrate holders having insulator-buried divided electrodes for supply of a.c. of multiple frequencies)
IT 7631-86-9, Silica, processes
(film; plasma **etching** of films using substrate holders having insulator-buried divided electrodes)

L98 ANSWER 5 OF 13 HCA COPYRIGHT 2002 ACS
126:194190 Plasma vacuum processing apparatus and processing semiconductor materials by apparatus thereof. Sasamura, Yoshitaka; Matsuda, Koji (Nissin Electric Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 09022899 A2 19970121 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1996-28199 19960215. PRIORITY: JP 1995-108827 19950502.
AB The title app. for plasma **vapor** deposition or plasma dry

etching of semiconductor materials provides a high-frequency a.c. and **d.c.** voltage for plasma-activating reactive **gases** in treatment of a substrate material on an **electrostatic** chuck provided in a vacuum chamber. The app. has a pedestal shaft for detecting the strength of adhesion of the semiconductor material set on the **electrostatic** chuck so that the temp. of the semiconductor material is detd. accurately from the chuck by holding a good thermal cond. between the chuck and the material without clearance.

IC ICM H01L021-3065
ICS C23C016-50; C23F004-00; H01L021-205; H01L021-31; H01L021-68
CC 76-12 (Electric Phenomena)
ST plasma **vapor** deposition app semiconductor temp; **etching** plasma **electrostatic** chuck adhesion temp
IT Thermal conductivity
(**electrostatic** chuck; plasma vacuum processing app. and processing semiconductor materials by app. thereof)
IT **Etching**
Vapor deposition process
(plasma; plasma vacuum processing app. and processing semiconductor materials by app. thereof)

L98 ANSWER 6 OF 13 HCA COPYRIGHT 2002 ACS
125:210569 Plasma treatment apparatus. Sasamura, Yoshitaka; Matsuda, Koji (Nissin Electric Co Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 08170180 A2 19960702 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-315326 19941219.

AB In an app. for plasma treatment, the object of treatment is supported on an electrode via an insulating film and is treated by plasma generated by applying high-frequency power to the electrode. At the same time, the object of treatment is supported on the electrode by **electrostatic** forces generated by a plasma-induced self-bias voltage and **d.c.** voltage applied to the electrode. A current detector detects if the leakage current in the insulating film exceeds a certain value and in such a case the plasma treatment is terminated. The pulse-like discharge in the insulating film is prevented. The app. is suitable for **etching**, CVD, etc., in the processing of wafers.

IC ICM C23F004-00
ICS H01L021-205; H01L021-3065; H05H001-46
CC 76-11 (Electric Phenomena)
IT **Etching**
Vapor deposition processes
(app., plasma treatment app.)

L98 ANSWER 7 OF 13 HCA COPYRIGHT 2002 ACS
123:356960 **Electrostatic** chucks and surface treatment methods for them. Sato, Katsumi (Fujitsu Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 07245336 A2 19950919 Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-33653 19940303.

AB **Electrostatic** chucks for holding semiconductor wafers (e.g., in **vapor** deposition app., **etching** app.,

etc.) by means of a static charge produced by the application of a polarized **d.c.** voltage to electrodes within the chuck body are described in which the chuck surface was exposed to a plasma. Surface treatment of the chuck is also described. Preferably, the chuck surface is formed from a ceramic with a resistivity of 109-1014 .OMEGA.-cm, and the plasma is formed in a nonreactive **gas** to which oxygen or nitrogen may be added. The surface-treated chucks provide for more uniform mounting than conventional chucks.

IC ICM H01L021-68
ICS B23Q003-15; H01J037-317; H01L021-203; H01L021-265; H01L021-3065; H02N013-00

CC 76-14 (Electric Phenomena)

ST **electrostatic** chuck plasma surface treatment

IT Holders
(chucks, **electrostatic**; **electrostatic** chucks and surface treatment methods for them)

IT Electric apparatus
Plasma
(**electrostatic** chucks and surface treatment methods for them)

IT 7440-37-1, Argon, reactions 7727-37-9, Nitrogen, reactions 7782-44-7, Oxygen, reactions
(**electrostatic** chucks and surface treatment methods for them)

L98 ANSWER 8 OF 13 HCA COPYRIGHT 2002 ACS

123:230918 Safe resin cast moldings for electric devices and method for their manufacture. Maeda, Teruhiko; Ito, Yoshihiro; Kao, Min Tai; Kato, Tsugio; Yasuda, Toshichika (Tokyo Shibaura Electric Co, Japan). Jpn. Kokai Tokkyo Koho JP 07195384 A2 19950801 Heisei, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-337569 19931228.

AB The title cast moldings, which release no toxic **gas** in the event of fire and can tolerate environment contaminated by moisture and dust, are made from resins filled with inorg. particles such as alumina and silica and have outer surface abundant with exposed inorg. particles. The cast moldings are useful as cable supporters in glass insulator, bushings, etc. The inorg. particles are brought to molding surface by: (a) migration method, i.e., applying a **DC** current to mold surface so that an **electrostatic** charge opposite to that of fillers is formed and attract fillers to molding surface before curing; (b) **etching** method, i.e. degrading away the cured resin on molding surface by heating in the presence of O; (c) in-mold coating method, i.e. applying a compn. contg. binders and fillers to the mold surface precoated with release agent then cast molding of filled resin; or (d) de-molded coating method, i.e. cast molding as usual by mold precoated with release agent, removing the release agent from molding surface and coating with a compn. contg. binders and fillers.

IC ICM B29C039-02
ICS B29C039-26; B29C039-38

ICI B29K105-16, B29L031-34
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76

L98 ANSWER 9 OF 13 HCA COPYRIGHT 2002 ACS
123:215885 Plasma treatment. Nagayama, Tetsuji (Sony Corp, Japan). Jpn. Kokai Tokkyo Koho JP 07115085 A2 19950502 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-258614 19931015.
AB The title process comprises plasma treatment of a substrate on a substrate holder having a monopolar **electrostatic** chuck, and interruption of application of a **d.c.** voltage to the chuck, generation of a plasma from a **gas** for removal of residual charges (e.g., the **gas** is supplied while plasma discharge remains after termination of plasma treatment), and removal of the residual charges on the chuck with application of a bias to the substrate holder. Removal of the residual charges can be quickly carried out without damage to the product or the result of the plasma treatment, and without modification of an existing app.
IC ICM H01L021-3065
ICS H01L021-205; H01L021-68
CC 76-11 (Electric Phenomena)
Section cross-reference(s): 75
ST plasma treatment **electrostatic** chuck substrate holding; residual charge removal **electrostatic** chuck
IT Electric charge
Vapor deposition processes
(removal of residual charges from substrate-holding **electrostatic** chuck after process with plasma)
IT Sputtering
(**etching**, for removal of residual charges from substrate-holding **electrostatic** chuck after process)
IT **Etching**
(sputter, for removal of residual charges from substrate-holding **electrostatic** chuck after process)
IT 7440-37-1, Argon, processes 7440-59-7, Helium, processes
(for removal of residual charges from substrate-holding **electrostatic** chuck after plasma treatment)

L98 ANSWER 10 OF 13 HCA COPYRIGHT 2002 ACS
103:9856 Ion-supported hard material coating of substrates. Bollinger, Helmut; Lunow, Thomas; Wilberg, Ruediger (VEB Hochvakuum Dresden, Ger. Dem. Rep.). Ger. (East) DD 215922 A1 19841128, 7 pp. (German). CODEN: GEXXA8. APPLICATION: DD 1982-240784 19820616.
AB A substrate body in 3 dimensions is uniformly and selectively (as to directions) ion coated with hard materials by using near the substrate body an independent **d.c.** elec. field, optionally modulated with an a.c. one to direct the coating ion flow from the source (material to be coated with) to the cathode substrate to ensure a perpendicular impingement of the ions on the substrate body in all directions. The main ion generation is controlled corresponding to the amt. of ions produced by the

independent elec. field near the substrate. The total surface of the twist drill from hard metal, not only the end surface (conventional), was ion implanted with C in gasoline **gas** by sputter-**etching** 1st with inert **gas** ions, uses as carrier **gas**. The pos. charged C ion flux was accelerated to the cathode substrate direction and the independent **electrostatic** field near the substrate, act selectively to ensure a perpendicular ion impingement. The ion flow spread into a bell shape and surrounded the radially set drill, resulting in uniform C layer thickness.

IC ICM C23C013-08
CC 55-6 (Ferrous Metals and Alloys)
Section cross-reference(s): 56, 76

L98 ANSWER 11 OF 13 HCA COPYRIGHT 2002 ACS
84:125649 Corrosion resistant metal coatings. Hasegawa, Takashi (Japan). Japan. Kokai JP 50075133 19750620 Showa, 2 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1973-125085 19731106.

AB A corrosion-resistant coating is formed by pos. charging a metal **vapor** in low-pressure H2O (g) or inert **gas**, depositing on a neg. charged metal substrate, impregnating the film with an organosilicon compd., and sealing by heating. Thus, a mild steel substrate was charged to -800 V **d.c.** in 0.002 torr H2O (g). A 13.6 MHz field was **impressed** between a ground Ti [7440-32-6] **vapor** source and a high-frequency coil. Following discharging, the Ti electrode was heated to form Ti **vapor** which deposited on the substrate. The substrate was heated 3 hr at 800.degree., cooled, impregnated with Et silicate [11099-06-2] and heated for 10 min at 500.degree. to seal the the Ti with SiO2 [7631-86-9]. The coated steel showed no surface changes after 500 hr in a 10% salt **spray** test.

IC C23C
CC 56-5 (Nonferrous Metals and Alloys)
ST **electrostatic** titanium coating steel
IT Coating process
(of steel, **electrostatic**, with titanium)
IT 7440-32-6, uses and miscellaneous
(coating with, **electrostatic**, on steel)
IT 7631-86-9, uses and miscellaneous 11099-06-2
(sealing of **electrostatically** deposited titanium coatings on steel with)

L98 ANSWER 12 OF 13 HCA COPYRIGHT 2002 ACS
83:200261 Image-forming materials for photomasks. Yamagishi, Hideki; Yamaguchi, Yasuhiko; Hiramoto, Hiroo; Hatada, Kenji; Nakahara, Katsuji (Toray Industries, Inc., Japan). Japan. Kokai JP 50054674 19750514 Showa, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1973-103763 19730917.

AB Metals and(or) metal compds. are coated (30-2000 nm) on an org. polymer support by using an ionization-**electrostatic** deposition method to give an imaging sheet. Images may be obtained either by photoetching of the deposited metals and(or) metal

compds., or by performing the deposition through an appropriate mask. The ionization-**electrostatic** deposition method yields metal and(or) metal compd. coatings having good adhesion to the support, and hence the imaged sheet is useful as a photomask for various photofabrication processes. Thus, a 100-.mu. thick poly(ethylene terephthalate) film was moving in contact with a water-cooled metal drum, while Al was placed in a carbon crucible, a metal screen cathode was placed between the drum and the crucible which was also used as anode, then 3 kV **d.c.** was applied between the anode and the cathode, while 500 V a.c. (13.56 MHz) was applied between the drum and the crucible in order to neutralize the pos. charge accumulating on the film, then the Al was evapd. from the crucible under .apprx.10-2 torr Ar; the Al **vapor** was ionized by the plasma, accelerated by the elec. field, and deposited on the poly(ethylene terephthalate) film. The 100 mm thick Al layer was then coated with a photoresist, exposed through a pos. original, developed, and **etched** in 3% NaOH to give a neg. photomask; the Al image had an optical d. of .gtoreq.3.0 and did not peel off even when the mask was used .gtoreq.40 times for the photofabrication of Cu-laminated plates.

IC C23C; B41C

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic Processes)

IT 7429-90-5, uses and miscellaneous
(coating of, on poly(ethylene terephthalate) film by ionization-**electrostatic** method for photomasks)

IT 25038-59-9, uses and miscellaneous
(coating of, with aluminum, by ionization-**electrostatic** method for photomasks)

L98 ANSWER 13 OF 13 HCA COPYRIGHT 2002 ACS

67:16723 Electrophotographic metal images. Kaspaul, Alfred F.; Christensen, John W. (Minnesota Mining and Manufg. Co.). U.S. US 3317409 19670502, 5 pp. (English). CODEN: USXXAM. APPLICATION: US 19630416.

AB A metal film (8-15 m.mu. of Co, Ti, V) of very low cond., on a 0.5-2 mil conventional photoconductor layer (ZnO-resinous binder) is **etched** imagewise by electrolysis during or after the formation of an **electrostatic** latent image in the photoconductor, by application of an aq. ionizing salt soln. (forming a sol. or colorless insol. salt with the oxidized metal and having a sp. resistivity of 300 ohm-cm. at 25.degree.) as electrolyte and of a 50 v. **d.c.** potential, using the electrolyte as cathode and the conductive base of the material as anode. The electron flow in the exposed areas is >10-fold above that in the background. V images have high resoln., excellent contrast, and superior stability. An invisible nucleating subcoating (0.01 mg. nichrome per 100 sq. cm.; 1012-1015 atoms/sq. cm.) enhances deposition and adherence of the image metal, the **vapor** coating of which is continued until a photocell indicates an optical transmissivity of about 50% (40-70%) for a piece of test glass coated simultaneously. The copy sheets are

dark-adapted for 24-48 hrs. prior to use. E.g., a 700 ft.-candle illumination is employed with a neg. original for 5 sec. Immediately after the exposure a 60-v. **d.c.** potential is applied between a spongy cathode, filled with aq. oxalic acid or K oxalate, and the Al base; 50-60 millicoulombs/sq. cm. generally yield good contrast in the pos. image.

NCL 204018000
CC 74 (Radiation Chemistry, Photochemistry, and Photographic Processes)